|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1. An unknown substance dissolves readily in water but not in benzene (a nonpolar solvent). Molecules of what type are present in the substance?   |  |  |  | | --- | --- | --- | |  | a. | neither polar nor nonpolar | |  | b. | polar | |  | c. | either polar or nonpolar | |  | d. | nonpolar | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.1 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | Chemistry | general chemistry | solution formation | solutions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 2. The interaction between solute particles and water molecules, which tends to cause a salt to fall apart in water, is called   |  |  |  | | --- | --- | --- | |  | a. | hydration | |  | b. | polarization | |  | c. | dispersion | |  | d. | coagulation | |  | e. | conductivity |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.1 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | Chemistry | general chemistry | solution formation | solutions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 3. Consider two organic molecules, ethanol and benzene. One dissolves in water and the other does not. Why?   |  |  |  | | --- | --- | --- | |  | a. | They have different molar masses. | |  | b. | One is ionic, the other is not. | |  | c. | One is an electrolyte, the other is not. | |  | d. | Ethanol contains a polar O–H bond, and benzene does not. | |  | e. | Two of these are correct. |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 4.1 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | Chemistry | general chemistry | solution formation | solutions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 4. Polar molecules have an unequal distribution of charge within the molecule.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | True | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.1 | | *QUESTION TYPE:* | True / False | | *HAS VARIABLES:* | False | | *KEYWORDS:* | Chemistry | general chemistry | solution formation | solutions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 5. Which of the following is a strong acid?   |  |  |  | | --- | --- | --- | |  | a. | HF | |  | b. | KOH | |  | c. | HClO4 | |  | d. | HClO | |  | e. | HBrO |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.2 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | electrolyte | general chemistry | ions in aqueous solution | strong electrolyte | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 6. All of the following are weak acids *except*   |  |  |  | | --- | --- | --- | |  | a. | HCNO | |  | b. | HBr | |  | c. | HF | |  | d. | HNO2 | |  | e. | HCN |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.2 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | electrolyte | general chemistry | ions in aqueous solution | strong electrolyte | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 7. Which of the following is *not* a strong base?   |  |  |  | | --- | --- | --- | |  | a. | Ca(OH)2 | |  | b. | KOH | |  | c. | NH3 | |  | d. | LiOH | |  | e. | Sr(OH)2 |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.2 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | electrolyte | general chemistry | ions in aqueous solution | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8. Which of the following is paired incorrectly?   |  |  |  | | --- | --- | --- | |  | a. | H2SO4 – strong acid | |  | b. | HNO3 – weak acid | |  | c. | Ba(OH)2 – strong base | |  | d. | HCl – strong acid | |  | e. | NH3 – weak base |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.2 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | electrolyte | general chemistry | ions in aqueous solution | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 9. The man who discovered the essential nature of acids through solution conductivity studies is   |  |  |  | | --- | --- | --- | |  | a. | Priestly | |  | b. | Boyle | |  | c. | Einstein | |  | d. | Mendeleev | |  | e. | Arrhenius |  |  |  | | --- | --- | | *ANSWER:* | e | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.2 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | electrolyte | general chemistry | ions in aqueous solution | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 10. A solid acid HX is mixed with water. Two possible solutions can be obtained. Which of the following is true?   |  |  | | --- | --- | |  | I.            II. |  |  |  |  | | --- | --- | --- | |  | a. | In case I, HX is acting like a weak acid, and in case II, HX is acting like a strong acid. | |  | b. | In case I, HX is acting like a strong acid, and in case II, HX is acting like a weak acid. | |  | c. | In both cases, HX is acting like a strong acid. | |  | d. | In both cases, HX is acting like a weak acid. | |  | e. | HX is not soluble in water. |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 4.2 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | electrolyte | general chemistry | ions in aqueous solution | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 11. An acid is a substance that produces OH– ions in water.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.2 | | *QUESTION TYPE:* | True / False | | *HAS VARIABLES:* | False | | *KEYWORDS:* | acid definition | acid-base reaction | chemical reactions | Chemistry | general chemistry | types of chemical reactions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 12. A 14.2-g sample of HF is dissolved in water to give 2.0 × 102 mL of solution. The concentration of the solution is:   |  |  |  | | --- | --- | --- | |  | a. | 0.71 *M* | |  | b. | 0.14 *M* | |  | c. | 0.07 *M* | |  | d. | 3.5 *M* | |  | e. | 7.1 *M* |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.3 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | True | | *KEYWORDS:* | chemical reactions | Chemistry | concentration | general chemistry | working with solutions | | *OTHER:* | Quantitative | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 13. 1.00 mL of a 3.55 × 10–4 *M* solution of oleic acid is diluted with 9.00 mL of petroleum ether, forming solution A. Then 2.00 mL of solution A is diluted with 8.00 mL of petroleum ether, forming solution B. What is the concentration of solution B?   |  |  |  | | --- | --- | --- | |  | a. | 3.55 × 10–6 *M* | |  | b. | 9.86 × 10–6 *M* | |  | c. | 7.10 × 10–5 *M* | |  | d. | 7.89 × 10–5 *M* | |  | e. | 7.10 × 10–6 *M* |  |  |  | | --- | --- | | *ANSWER:* | e | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 4.3 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | True | | *KEYWORDS:* | chemical reactions | Chemistry | diluting solutions | general chemistry | working with solutions | | *OTHER:* | Quantitative | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 14. 1.00 mL of a 3.05 × 10–4 *M* solution of oleic acid is diluted with 9.00 mL of petroleum ether, forming solution A. Then 2.00 mL of solution A is diluted with 8.00 mL of petroleum ether, forming solution B. How many grams of oleic acid are 5.00 mL of solution B? (Molar mass for oleic acid = 282 g/mol)   |  |  |  | | --- | --- | --- | |  | a. | 4.30 × 10–6 g | |  | b. | 1.19 × 10–5 g | |  | c. | 1.72 × 10–2 g | |  | d. | 8.60 × 10–6 g | |  | e. | 4.30 × 10–4 g |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | Difficult | | *REFERENCES:* | 4.3 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | True | | *KEYWORDS:* | chemical reactions | Chemistry | diluting solutions | general chemistry | working with solutions | | *OTHER:* | Quantitative | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 15. How many grams of NaCl are contained in 350. mL of a 0.115*M* solution of sodium chloride?   |  |  |  | | --- | --- | --- | |  | a. | 6.7 g | |  | b. | 2.35 g | |  | c. | 4.70 g | |  | d. | 40.3 g | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 4.3 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | True | | *KEYWORDS:* | chemical reactions | Chemistry | concentration | general chemistry | working with solutions | | *OTHER:* | Quantitative | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 16. Which of the following aqueous solutions contains the greatest number of ions?   |  |  |  | | --- | --- | --- | |  | a. | 400.0 mL of 0.10 *M* NaCl | |  | b. | 300.0 mL of 0.10 *M* CaCl2 | |  | c. | 200.0 mL of 0.10 *M* FeCl3 | |  | d. | 200.0 mL of 0.10 *M* KBr | |  | e. | 800.0 mL of 0.10 *M* sucrose |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.3 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | concentration | general chemistry | working with solutions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 17. What mass of calcium chloride, CaCl2, is needed to prepare 4.600 L of a 1.53*M* solution?   |  |  |  | | --- | --- | --- | |  | a. | 334 g | |  | b. | 7.04 g | |  | c. | 36.9 g | |  | d. | 111 g | |  | e. | 781 g |  |  |  | | --- | --- | | *ANSWER:* | e | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.3 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | True | | *KEYWORDS:* | chemical reactions | Chemistry | concentration | general chemistry | working with solutions | | *OTHER:* | Quantitative | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 18. A 72.5-g sample of SrCl2 is dissolved in 112.5 mL of solution. Calculate the molarity of this solution.   |  |  |  | | --- | --- | --- | |  | a. | 51.5 *M* | |  | b. | 4.07 *M* | |  | c. | 102.2 *M* | |  | d. | 0.644 *M* | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.3 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | True | | *KEYWORDS:* | chemical reactions | Chemistry | concentration | general chemistry | working with solutions | | *OTHER:* | Quantitative | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 19. What mass of solute is contained in 256 mL of a 0.944*M* ammonium chloride solution?   |  |  |  | | --- | --- | --- | |  | a. | 12.9 g | |  | b. | 197 g | |  | c. | 14.5 g | |  | d. | 242 g | |  | e. | 3.69 g |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.3 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | True | | *KEYWORDS:* | chemical reactions | Chemistry | concentration | general chemistry | working with solutions | | *OTHER:* | Quantitative | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 20. A 61.08-g sample of Ba(OH)2 is dissolved in enough water to make 1.800 liters of solution. How many mL of this solution must be diluted with water in order to make 1.000 L of 0.100 *M* Ba(OH)2?   |  |  |  | | --- | --- | --- | |  | a. | 505 mL | |  | b. | 198 mL | |  | c. | 19.8 mL | |  | d. | 3.57 mL | |  | e. | 280 mL |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 4.3 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | True | | *KEYWORDS:* | chemical reactions | Chemistry | diluting solutions | general chemistry | working with solutions | | *OTHER:* | Quantitative | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 21. What volume of 18 *M* sulfuric acid must be used to prepare 1.80 L of 0.205*M* H2SO4?   |  |  |  | | --- | --- | --- | |  | a. | 21 mL | |  | b. | 0.37 mL | |  | c. | 2.1 × 103 mL | |  | d. | 4.1 mL | |  | e. | 6.6 mL |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.3 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | True | | *KEYWORDS:* | chemical reactions | Chemistry | diluting solutions | general chemistry | working with solutions | | *OTHER:* | Quantitative | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 22. How many grams of NaOH are contained in 5.0 × 102 mL of a 0.81*M* sodium hydroxide solution?   |  |  |  | | --- | --- | --- | |  | a. | 16 g | |  | b. | 81 g | |  | c. | 0.41 g | |  | d. | 32 g | |  | e. | 405 g |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.3 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | True | | *KEYWORDS:* | chemical reactions | Chemistry | concentration | general chemistry | working with solutions | | *OTHER:* | Quantitative | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 23. An analytical procedure requires a solution of chloride ions. How many grams of CaCl2 must be dissolved to make 1.95 L of 0.0439*M* Cl–?   |  |  |  | | --- | --- | --- | |  | a. | 9.74 g | |  | b. | 0.400 g | |  | c. | 4.75 g | |  | d. | 2.44 g | |  | e. | 19.0 g |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 4.3 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | True | | *KEYWORDS:* | chemical reactions | Chemistry | concentration | general chemistry | working with solutions | | *OTHER:* | Quantitative | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 1/31/2017 2:42 AM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 24. The concentration of a salt water solution that sits in an open beaker decreases over time.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.3 | | *QUESTION TYPE:* | True / False | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | concentration | general chemistry | working with solutions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 25. You have two solutions of chemical *A*. To determine which has the highest concentration of *A* in molarity, what is the minimum number of the following you must know?   |  |  | | --- | --- | | I. | the mass in grams of *A* in each solution | | II. | the molar mass of *A* | | III. | the volume of water added to each solution | | IV. | the total volume of the solution |  |  |  |  | | --- | --- | --- | |  | a. | 0 | |  | b. | 1 | |  | c. | 2 | |  | d. | 3 | |  | e. | You must know all of them. |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.3 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | concentration | general chemistry | working with solutions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 26. Diabetics often need injections of insulin to help maintain the proper blood glucose levels in their bodies. How many moles of insulin are needed to make up 45 mL of 0.0062*M* insulin solution?   |  |  |  | | --- | --- | --- | |  | a. | 0.00056 mol | |  | b. | 0.14 mol | |  | c. | 7.3 mol | |  | d. | 0.28 mol | |  | e. | 0.00028 mol |  |  |  | | --- | --- | | *ANSWER:* | e | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.3 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | True | | *KEYWORDS:* | chemical reactions | Chemistry | concentration | general chemistry | working with solutions | | *OTHER:* | Quantitative | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 27. You have two solutions of sodium chloride. One is a 2.00 *M* solution, the other is a 4.00 *M* solution. You have much more of the 4.00 *M* solution and you add the solutions together. Which of the following could be the concentration of the final solution?   |  |  |  | | --- | --- | --- | |  | a. | 2.20 *M* | |  | b. | 3.00 *M* | |  | c. | 3.20 *M* | |  | d. | 6.00 *M* | |  | e. | 6.60 *M* |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.3 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | True | | *KEYWORDS:* | chemical reactions | Chemistry | concentration | general chemistry | working with solutions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 28. You have equal masses of different solutes dissolved in equal volumes of solution. Which of the solutes would make the solution having the highest molar concentration?   |  |  |  | | --- | --- | --- | |  | a. | NaOH | |  | b. | KCl | |  | c. | KOH | |  | d. | LiOH | |  | e. | all the same |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 4.3 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | concentration | general chemistry | working with solutions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 29. Which of the following do you need to know to be able to calculate the molarity of a salt solution?    I.   the mass of salt added   II.   the molar mass of the salt III.    the volume of water added IV.    the total volume of the solution   |  |  |  | | --- | --- | --- | |  | a. | I, III | |  | b. | I, II, III | |  | c. | II, III | |  | d. | I, II, IV | |  | e. | You need all of the information. |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.3 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | concentration | general chemistry | working with solutions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 30. A 230.0-mL sample of a 0.275 *M* solution is left on a hot plate overnight; the following morning the solution is 1.41*M*. What volume of solvent has evaporated from the 0.275 *M* solution?   |  |  |  | | --- | --- | --- | |  | a. | 44.9 mL | |  | b. | 63.3 mL | |  | c. | 185.1 mL | |  | d. | 230. mL | |  | e. | 274.9 mL |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 4.3 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | True | | *KEYWORDS:* | chemical reactions | Chemistry | diluting solutions | general chemistry | working with solutions | | *OTHER:* | Quantitative | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 31. For the reaction 4FeCl2(*aq*) + 3O2(*g*) → 2Fe2O3(*s*) + 4Cl2(*g*), what volume of a 0.945 M solution of FeCl2 is required to react completely with 4.32 ×1021 molecules of O2?   |  |  |  | | --- | --- | --- | |  | a. | 4.23 × 103mL | |  | b. | 9.04 mL | |  | c. | 5.69 mL | |  | d. | 10.1 mL | |  | e. | 5.08 mL |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | Difficult | | *REFERENCES:* | 4.3 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | True | | *KEYWORDS:* | amounts of substances | Chemistry | general chemistry | stoichiometry | stoichiometry calculation | | *OTHER:* | Quantitative | | *DATE CREATED:* | 2/3/2017 4:59 AM | | *DATE MODIFIED:* | 3/31/2017 12:44 AM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 32. Phosphoric acid, H3PO4, is a triprotic acid. What is the total number of moles of H+ available for reaction in 1.50 L of 0.500*M* H3PO4?   |  |  |  | | --- | --- | --- | |  | a. | 0.167 mole | |  | b. | 1.50 mole | |  | c. | 0.250 mole | |  | d. | 3.00 moles | |  | e. | 2.25 moles |  |  |  | | --- | --- | | *ANSWER:* | e | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.3 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | True | | *KEYWORDS:* | chemical reactions | Chemistry | concentration | general chemistry | working with solutions | | *OTHER:* | Quantitative | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 33. The following reactions:            Pb2+ + 2I– → PbI2 2Ce4+ + 2I– → I2 + 2Ce3+ HOAc + NH3 → NH4+ + OAc– are examples of   |  |  |  | | --- | --- | --- | |  | a. | acid-base reactions | |  | b. | unbalanced reactions | |  | c. | precipitation, acid-base, and redox reactions, respectively | |  | d. | redox, acid-base, and precipitation reactions, respectively | |  | e. | precipitation, redox, and acid-base reactions, respectively |  |  |  | | --- | --- | | *ANSWER:* | e | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.4 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | types of chemical reactions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 34. The following reactions                2K(*s*) + Br2(*l*) → 2KBr(*s*)                AgNO3(*aq*) + NaCl(*aq*) → AgCl(*s*) + NaNO3(*aq*)                HCl(*aq*) + KOH(*aq*) → H2O(*l*) + KCl(*aq*) are examples of   |  |  |  | | --- | --- | --- | |  | a. | precipitation reactions | |  | b. | redox, precipitation, and acid-base, respectively | |  | c. | precipitation (two) and acid-base reactions, respectively | |  | d. | redox reactions | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.4 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | types of chemical reactions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 35. The following reactions                ZnBr2(*aq*) + 2AgNO3(*aq*) → Zn(NO3)2(*aq*) + 2AgBr(*s*)                KBr(*aq*) + AgNO3(*aq*) → AgBr(*s*) + KNO3(*aq*) are examples of   |  |  |  | | --- | --- | --- | |  | a. | oxidation-reduction reactions | |  | b. | acid-base reactions | |  | c. | precipitation reactions | |  | d. | A and C | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.4 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | types of chemical reactions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 36. All of the following reactions                2Al(*s*) + 3Br2(*l*) → 2AlBr3(*s*)                2Ag2O(*s*) → 4Ag(*s*) + O2(*g*)                CH4(*l*) + 2O2(*g*) → CO2(*g*) + 2H2O(*g*) can be classified as   |  |  |  | | --- | --- | --- | |  | a. | oxidation-reduction reactions | |  | b. | combustion reactions | |  | c. | precipitation reactions | |  | d. | A and B | |  | e. | A and C |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.4 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | oxidation-reduction reaction | types of chemical reactions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 37. You have exposed electrodes of a light bulb in a solution of H2SO4 such that the light bulb is on. You add a dilute solution and the bulb grows dim. Which of the following could be in the solution?   |  |  |  | | --- | --- | --- | |  | a. | Ba(OH)2 | |  | b. | NaNO3 | |  | c. | K2SO4 | |  | d. | Cu(NO3)2 | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 4.5 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | ions in aqueous solution | solubility rules | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 38. Aqueous solutions of sodium sulfide and copper(II) chloride are mixed together. Which statement is correct?   |  |  |  | | --- | --- | --- | |  | a. | Both NaCl and CuS precipitate from solution. | |  | b. | No reaction will occur. | |  | c. | CuS will precipitate from solution. | |  | d. | NaCl will precipitate from solution. | |  | e. | A gas is released. |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.5 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | ions in aqueous solution | solubility rules | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 39. Aqueous solutions of potassium sulfate and ammonium nitrate are mixed together. Which statement is correct?   |  |  |  | | --- | --- | --- | |  | a. | Both KNO3 and NH4SO4 precipitate from solution. | |  | b. | A gas is released. | |  | c. | NH4SO4 will precipitate from solution. | |  | d. | KNO3 will precipitate from solution. | |  | e. | No reaction will occur. |  |  |  | | --- | --- | | *ANSWER:* | e | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.5 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | ions in aqueous solution | solubility rules | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 40. Which of the following salts is insoluble in water?   |  |  |  | | --- | --- | --- | |  | a. | Na2S | |  | b. | K2CO3 | |  | c. | Pb(NO3)2 | |  | d. | CaCl2 | |  | e. | All of these are soluble in water. |  |  |  | | --- | --- | | *ANSWER:* | e | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.5 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | ions in aqueous solution | solubility rules | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 41. How many of the following salts are expected to be insoluble in water?   |  |  | | --- | --- | | sodium sulfide | barium nitrate | | ammonium sulfate | potassium phosphate |  |  |  |  | | --- | --- | --- | |  | a. | none | |  | b. | 1 | |  | c. | 2 | |  | d. | 3 | |  | e. | 4 |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.5 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | ions in aqueous solution | solubility rules | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 42. When NH3(*aq*) is added to Cu2+(*aq*), a precipitate initially forms. Its formula is:   |  |  |  | | --- | --- | --- | |  | a. | Cu(NH)3 | |  | b. | Cu(NO3)2 | |  | c. | Cu(OH)2 | |  | d. | Cu(NH3)22+ | |  | e. | CuO |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 4.5 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | ions in aqueous solution | solubility rules | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 43. Which of the following ions is most likely to form an insoluble sulfate?   |  |  |  | | --- | --- | --- | |  | a. | K+ | |  | b. | Li+ | |  | c. | Ca2+ | |  | d. | S2– | |  | e. | Cl– |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.5 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | ions in aqueous solution | solubility rules | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 44. Which of the following compounds is soluble in water?   |  |  |  | | --- | --- | --- | |  | a. | Ni(OH)2 | |  | b. | K3PO4 | |  | c. | BaSO4 | |  | d. | CoCO3 | |  | e. | PbCl2 |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.5 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | ions in aqueous solution | solubility rules | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 45. Which pair of ions would *not* be expected to form a precipitate when dilute solutions of each are mixed?   |  |  |  | | --- | --- | --- | |  | a. | Al3+, S2– | |  | b. | Pb2+, Cl– | |  | c. | Ba2+, PO43– | |  | d. | Pb2+, OH– | |  | e. | Mg2+, SO42– |  |  |  | | --- | --- | | *ANSWER:* | e | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.5 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | ions in aqueous solution | solubility rules | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 46. A solution contains the ions Ag+, Pb2+, and Ni2+. Dilute solutions of NaCl, Na2SO4, and Na2S are available to separate the positive ions from each other. In order to effect separation, the solutions should be added in which order?   |  |  |  | | --- | --- | --- | |  | a. | Na2SO4, NaCl, Na2S | |  | b. | Na2SO4, Na2S, NaCl | |  | c. | Na2S, NaCl, Na2SO4 | |  | d. | NaCl, Na2S, Na2SO4 | |  | e. | NaCl, Na2SO4, Na2S |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Difficult | | *REFERENCES:* | 4.5 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | precipitation reaction | selective precipitation | types of chemical reactions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 47. Consider an aqueous solution of calcium nitrate added to an aqueous solution of sodium phosphate. What is the formula of the solid formed in the reaction?   |  |  |  | | --- | --- | --- | |  | a. | Ca(PO4)2 | |  | b. | CaPO4 | |  | c. | Ca3(PO4)2 | |  | d. | Ca3(PO3)2 | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.5 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | precipitation reaction | types of chemical reactions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 48. The filtrate is the solid formed when two solutions are mixed.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.5 | | *QUESTION TYPE:* | True / False | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | precipitation reaction | types of chemical reactions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |
| --- |
| Aqueous solutions of barium chloride and silver nitrate are mixed to form solid silver chloride and aqueous barium nitrate. |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 49. The balanced molecular equation contains which one of the following terms?   |  |  |  | | --- | --- | --- | |  | a. | AgCl (*s*) | |  | b. | 2AgCl (*s*) | |  | c. | 2Ba(NO3)2 (*aq*) | |  | d. | BaNO3 (*aq*) | |  | e. | 3AgCl (*aq*) |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.6 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *PREFACE NAME:* | Ref 4-1 | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | ions in aqueous solution | molecular equation | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 50. The balanced complete ionic equation contains which of the following terms?   |  |  |  | | --- | --- | --- | |  | a. | 2Ba2+(*aq*) | |  | b. | Cl–(*aq*) | |  | c. | 2Ag+(*aq*) | |  | d. | NO3– (*aq*) | |  | e. | AgCl(*aq*) |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.6 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *PREFACE NAME:* | Ref 4-1 | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | ionic equation | ions in aqueous solution | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 51. The net ionic equation contains which of the following terms?   |  |  |  | | --- | --- | --- | |  | a. | Ag+(*aq*) | |  | b. | Ba2+(*aq*) | |  | c. | NO3– (*aq*) | |  | d. | H+ (*aq*) | |  | e. | AgCl(*aq*) |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.6 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *PREFACE NAME:* | Ref 4-1 | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | ionic equation | ions in aqueous solution | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 52. In writing the complete ionic equation for the reaction (if any) that occurs when aqueous solutions of KOH and Mg(NO3)2 are mixed, which of the following would *not* be written as ionic species?   |  |  |  | | --- | --- | --- | |  | a. | KOH | |  | b. | Mg(NO3)2 | |  | c. | Mg(OH)2 | |  | d. | KNO3 | |  | e. | All of the above would be written as ionic species. |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.6 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | precipitation reaction | types of chemical reactions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 53. The net ionic equation for the reaction of calcium bromide and sodium phosphate contains which of the following species?   |  |  |  | | --- | --- | --- | |  | a. | 2Br–(*aq*) | |  | b. | PO43–(*aq*) | |  | c. | 2Ca3(PO4)2(*s*) | |  | d. | 6NaBr(*aq*) | |  | e. | 3Ca2+(*aq*) |  |  |  | | --- | --- | | *ANSWER:* | e | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 4.6 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | ionic equation | ions in aqueous solution | net ionic equation | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 54. When sodium chloride and lead(II) nitrate react in an aqueous solution, which of the following terms will be present in the balanced molecular equation?   |  |  |  | | --- | --- | --- | |  | a. | PbCl(*s*) | |  | b. | Pb2Cl(*s*) | |  | c. | NaNO3(*aq*) | |  | d. | 2NaNO3(*aq*) | |  | e. | 2PbCl2(*s*) |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.6 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | ions in aqueous solution | molecular equation | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 55. Consider an aqueous solution of calcium nitrate added to an aqueous solution of sodium phosphate. Write and balance the equation for this reaction to answer the following question.What is the sum of the coefficients when the molecular equation is balanced in standard form?   |  |  |  | | --- | --- | --- | |  | a. | 4 | |  | b. | 5 | |  | c. | 7 | |  | d. | 11 | |  | e. | 12 |  |  |  | | --- | --- | | *ANSWER:* | e | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 4.6 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | ions in aqueous solution | molecular equation | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 56. When solutions of phosphoric acid and iron(III) nitrate react, which of the following terms will be present in the balanced molecular equation?   |  |  |  | | --- | --- | --- | |  | a. | HNO3(*aq*) | |  | b. | 3HNO3(*aq*) | |  | c. | 2FePO4(*s*) | |  | d. | 3FePO4(*s*) | |  | e. | 2HNO3(*aq*) |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.6 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | ions in aqueous solution | solubility rules | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 57. When solutions of cobalt(II) chloride and carbonic acid react, which of the following terms will be present in the net ionic equation?   |  |  |  | | --- | --- | --- | |  | a. | CoCO3(*s*) | |  | b. | H+(*aq*) | |  | c. | 2CoCO3(*s*) | |  | d. | 2Cl–(*aq*) | |  | e. | two of these |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 4.6 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | ionic equation | ions in aqueous solution | net ionic equation | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 58. When solutions of barium chloride and ammonium sulfate react, which of the following is a spectator ion?   |  |  |  | | --- | --- | --- | |  | a. | barium ion | |  | b. | chloride ion | |  | c. | ammonium ion | |  | d. | sulfate ion | |  | e. | two of these |  |  |  | | --- | --- | | *ANSWER:* | e | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 4.6 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | True | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | ionic equation | ions in aqueous solution | net ionic equation | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 59. The net ionic equation for the reaction of aluminum sulfate and sodium hydroxide contains which of the following species?   |  |  |  | | --- | --- | --- | |  | a. | 3Al3+(*aq*) | |  | b. | OH–(*aq*) | |  | c. | 3OH–(*aq*) | |  | d. | 2Al3+(*aq*) | |  | e. | 2Al(OH)3(*s*) |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 4.6 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | ionic equation | ions in aqueous solution | net ionic equation | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 60. Consider the reaction between 15.0 mL of a 1.00 *M* aqueous solution of AgNO3 and 10.0 mL of a 1.00 *M* aqueous solution of K2CrO4. When these react, a precipitate is observed. What is present in solution **after** the reaction is complete? Note: the solid is not considered to be in solution.   |  |  |  | | --- | --- | --- | |  | a. | Ag+, NO3–, K+, CrO42–, water | |  | b. | Ag+, NO3–, K+, water | |  | c. | K+, CrO42–, water | |  | d. | NO3–, K+, CrO42–, water | |  | e. | water |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 4.7 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | precipitation reaction | types of chemical reactions | | *OTHER:* | Quantitative | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 61. You mix 285.0 mL of 1.20 *M* lead(II) nitrate with 300.0 mL of 1.60*M* potassium iodide. The lead(II) iodide is insoluble. Which of the following is false?   |  |  |  | | --- | --- | --- | |  | a. | The final concentration of Pb2+ ions is 0.174 *M*. | |  | b. | You form 111 g of lead(II) iodide. | |  | c. | The final concentration of K+ is 0.821 *M*. | |  | d. | The final concentration of NO3– is 0.821 *M*. | |  | e. | All are true. |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 4.7 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | True | | *KEYWORDS:* | Chemistry | general chemistry | limiting reactant | stoichiometry | stoichiometry calculation | | *OTHER:* | Quantitative | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 2/2/2017 8:34 AM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 62. If all of the chloride in a 4.106-g sample of an unknown metal chloride is precipitated as AgCl with 70.90 mL of 0.2010 *M* AgNO3, what is the percentage of chloride in the sample?   |  |  |  | | --- | --- | --- | |  | a. | 50.52% | |  | b. | 12.30% | |  | c. | 1.425% | |  | d. | 8.127% | |  | e. | none of the above |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 4.7 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | True | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | gravimetric analysis | quantitative analysis | | *OTHER:* | Quantitative | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 63. A mixture of BaCl2 and NaCl is analyzed by precipitating all the barium as BaSO4. After addition of an excess of Na2SO4 to a 3.988-g sample of the mixture, the mass of precipitate collected is 2.113 g. What is the mass percentage of barium chloride in the mixture?   |  |  |  | | --- | --- | --- | |  | a. | 59.40% | |  | b. | 52.98% | |  | c. | 31.17% | |  | d. | 47.26% | |  | e. | 12.88% |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 4.7 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | True | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | gravimetric analysis | quantitative analysis | | *OTHER:* | Quantitative | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 64. A 3.00-g sample of an alloy (containing only Pb and Sn) was dissolved in nitric acid (HNO3). Sulfuric acid was added to this solution, which precipitated 1.90 g of PbSO4. Assuming that all of the lead was precipitated, what is the percentage of Sn in the sample? (molar mass of PbSO4 = 303.3 g/mol)   |  |  |  | | --- | --- | --- | |  | a. | 56.7% Sn | |  | b. | 0.626% Sn | |  | c. | 63.3% Sn | |  | d. | 43.3% Sn | |  | e. | 1.30% Sn |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 4.7 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | True | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | gravimetric analysis | quantitative analysis | | *OTHER:* | Quantitative | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 65. A mixture contained no fluorine compound except methyl fluoroacetate, FCH2COOCH3 (molar mass = 92.07 g/mol). When chemically treated, all the fluorine was converted to CaF2 (molar mass = 78.08 g/mol). The mass of CaF2 obtained was 20.1 g. Find the mass of methyl fluoroacetate in the original mixture.   |  |  |  | | --- | --- | --- | |  | a. | 34.1 g | |  | b. | 47.4 g | |  | c. | 17.0 g | |  | d. | 23.7 g | |  | e. | 11.9 g |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 4.7 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | True | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | gravimetric analysis | quantitative analysis | | *OTHER:* | Quantitative | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 66. A 1.63-g sample of a metal chloride, MCl2, is dissolved in water and treated with excess aqueous silver nitrate. The silver chloride that formed weighed 3.48 g. Calculate the molar mass of M.   |  |  |  | | --- | --- | --- | |  | a. | 70.9 g/mol | |  | b. | 32 g/mol | |  | c. | 64 g/mol | |  | d. | 67 g/mol | |  | e. | 72.4 g/mol |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Difficult | | *REFERENCES:* | 4.7 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | True | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | gravimetric analysis | quantitative analysis | | *OTHER:* | Quantitative | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 67. You have 132.4 mL of a 2.50 *M* solution of Na2CrO4(*aq*). You also have 125 mL of a 2.50 *M* solution of AgNO3(*aq*). Calculate the concentration of Na+ after the two solutions are mixed together.   |  |  |  | | --- | --- | --- | |  | a. | 0.00 *M* | |  | b. | 1.29 *M* | |  | c. | 2.57 *M* | |  | d. | 5.00 *M* | |  | e. | 0.662 *M* |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.7 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | True | | *KEYWORDS:* | chemical reactions | Chemistry | diluting solutions | general chemistry | working with solutions | | *OTHER:* | Quantitative | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 68. You have 75.0 mL of a 2.50 *M* solution of Na2CrO4(*aq*). You also have 125 mL of a 2.16*M* solution of AgNO3(*aq*). Calculate the concentration of CrO42– after the two solutions are mixed together.   |  |  |  | | --- | --- | --- | |  | a. | 0.00 *M* | |  | b. | 0.263 *M* | |  | c. | 0.938 *M* | |  | d. | 0.270 *M* | |  | e. | 2.50 *M* |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 4.7 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | True | | *KEYWORDS:* | Chemistry | general chemistry | limiting reactant | stoichiometry | stoichiometry calculation | | *OTHER:* | Quantitative | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 69. You have 75.0 mL of a 2.50 *M* solution of Na2CrO4(*aq*). You also have 125 mL of a 2.29*M* solution of AgNO3(*aq*). Calculate the concentration of Ag+ after the two solutions are mixed together.   |  |  |  | | --- | --- | --- | |  | a. | 0.00 *M* | |  | b. | 0.716 *M* | |  | c. | 1.43 *M* | |  | d. | 0.088 *M* | |  | e. | 0.286 *M* |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 4.7 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | True | | *KEYWORDS:* | Chemistry | general chemistry | limiting reactant | stoichiometry | stoichiometry calculation | | *OTHER:* | Quantitative | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 2/20/2017 1:14 AM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 70. You have 75.0 mL of a 2.50 *M* solution of Na2CrO4(*aq*). You also have 125 mL of a 2.24*M* solution of AgNO3(*aq*). Calculate the concentration of NO3– after the two solutions are mixed together.   |  |  |  | | --- | --- | --- | |  | a. | 0.00 *M* | |  | b. | 0.700 *M* | |  | c. | 1.40 *M* | |  | d. | 2.80 *M* | |  | e. | 4.50 *M* |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.7 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | True | | *KEYWORDS:* | chemical reactions | Chemistry | diluting solutions | general chemistry | working with solutions | | *OTHER:* | Quantitative | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 71. You mix 55 mL of 1.00 *M* silver nitrate with 25 mL of 0.55*M* sodium chloride. What mass of silver chloride should you form?   |  |  |  | | --- | --- | --- | |  | a. | 2.0 g | |  | b. | 3.9 g | |  | c. | 2.2 g | |  | d. | 4.3 | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.7 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | True | | *KEYWORDS:* | Chemistry | general chemistry | limiting reactant | stoichiometry | stoichiometry calculation | | *OTHER:* | Quantitative | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 72. When solutions of acetic acid and sodium hydroxide react, which of the following are NOT present in the *complete ionic equation*?   |  |  |  | | --- | --- | --- | |  | a. | hydrogen ion | |  | b. | acetate ion | |  | c. | sodium ion | |  | d. | hydroxide ion | |  | e. | water |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 4.8 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | True | | *KEYWORDS:* | chemical reactions | Chemistry | complete ionic equation | general chemistry | ionic equation | ions in aqueous solution | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 73. When solutions of acetic acid and sodium hydroxide react, which of the following are NOT present in the *net ionic equation*?   |  |  | | --- | --- | | I. | hydrogen ion | | II. | acetate ion | | III. | sodium ion | | IV. | hydroxide ion |  |  |  |  | | --- | --- | --- | |  | a. | I and II | |  | b. | I, II, and III | |  | c. | I and IV | |  | d. | I and III | |  | e. | II and III |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 4.8 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | True | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | ionic equation | ions in aqueous solution | net ionic equation | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 74. When solutions of carbonic acid and magnesium hydroxide react, which of the following are NOT present in the *net ionic equation*?   |  |  | | --- | --- | | I. | hydrogen ion | | II. | carbonate ion | | III. | magnesium ion | | IV. | hydroxide ion |  |  |  |  | | --- | --- | --- | |  | a. | I and II | |  | b. | I, II, and III | |  | c. | I and IV | |  | d. | I and III | |  | e. | II and III |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 4.8 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | True | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | ionic equation | ions in aqueous solution | net ionic equation | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 75. When solutions of acetic acid and magnesium hydroxide react, which of the following are spectator ions?   |  |  |  | | --- | --- | --- | |  | a. | hydrogen ion | |  | b. | acetate ion | |  | c. | magnesium ion | |  | d. | hydroxide ion | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | e | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 4.8 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | True | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | ionic equation | ions in aqueous solution | net ionic equation | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 76. In the balanced molecular equation for the neutralization of sodium hydroxide with sulfuric acid, the products are:   |  |  |  | | --- | --- | --- | |  | a. | NaSO4 + H2O | |  | b. | NaSO3 + 2H2O | |  | c. | 2NaSO4 + H2O | |  | d. | Na2S + 2H2O | |  | e. | Na2SO4 + 2H2O |  |  |  | | --- | --- | | *ANSWER:* | e | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.8 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | acid-base reaction | chemical reactions | Chemistry | general chemistry | neutralization reaction | types of chemical reactions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 77. A 0.307-g sample of an unknown triprotic acid is titrated to the third equivalence point using 35.2 mL of 0.106 *M* NaOH. Calculate the molar mass of the acid.   |  |  |  | | --- | --- | --- | |  | a. | 247 g/mol | |  | b. | 171 g/mol | |  | c. | 165 g/mol | |  | d. | 151 g/mol | |  | e. | 82.7 g/mol |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Difficult | | *REFERENCES:* | 4.8 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | acid-base reaction | chemical reactions | Chemistry | general chemistry | neutralization reaction | types of chemical reactions | | *OTHER:* | Quantitative | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 78. An unknown diprotic acid requires 42.57 mL of 0.111*M* NaOH to completely neutralize a 0.685-g sample. Calculate the approximate molar mass of the acid.   |  |  |  | | --- | --- | --- | |  | a. | 423 g/mol | |  | b. | 290 g/mol | |  | c. | 145 g/mol | |  | d. | 72 g/mol | |  | e. | 212 g/mol |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Difficult | | *REFERENCES:* | 4.8 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | True | | *KEYWORDS:* | acid-base reaction | chemical reactions | Chemistry | general chemistry | neutralization reaction | types of chemical reactions | | *OTHER:* | Quantitative | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 79. You have separate solutions of HCl and H2SO4 with the same concentrations in terms of molarity. You wish to neutralize a solution of NaOH. Which acid solution would require more volume (in mL) to neutralize the base?   |  |  |  | | --- | --- | --- | |  | a. | The HCl solution. | |  | b. | The H2SO4 solution. | |  | c. | You need to know the acid concentrations to answer this question. | |  | d. | You need to know the volume and concentration of the NaOH solution to answer this question. | |  | e. | C and D |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.8 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | acid-base reaction | chemical reactions | Chemistry | general chemistry | neutralization reaction | types of chemical reactions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 80. What mass of NaOH is required to react exactly with 25.0 mL of 2.2*M* H2SO4?   |  |  |  | | --- | --- | --- | |  | a. | 2.2 g | |  | b. | 0.9 g | |  | c. | 4.4 g | |  | d. | 110 g | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.8 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | True | | *KEYWORDS:* | acid-base reaction | chemical reactions | Chemistry | general chemistry | neutralization reaction | types of chemical reactions | | *OTHER:* | Quantitative | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 81. With what volume of 5.00 *M* HF will 4.03 g of calcium hydroxide react completely, according to the following reaction?   |  |  |  | | --- | --- | --- | |  | a. | 10.9 mL | |  | b. | 109 mL | |  | c. | 544 mL | |  | d. | 21.8 mL | |  | e. | 46.0 mL |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.8 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | True | | *KEYWORDS:* | acid-base reaction | chemical reactions | Chemistry | general chemistry | neutralization reaction | types of chemical reactions | | *OTHER:* | Quantitative | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 82. Sulfamic acid, HSO3NH2 (molar mass = 97.1 g/mol), is a strong monoprotic acid that can be used to standardize a strong base:    A 0.179-g sample of HSO3NH2 required 19.4 mL of an aqueous solution of KOH for a complete reaction. What is the molarity of the KOH solution?   |  |  |  | | --- | --- | --- | |  | a. | 0.00184 *M* | |  | b. | 9.50 *M* | |  | c. | 0.0950 *M* | |  | d. | 0.0358 *M* | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.8 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | True | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | quantitative analysis | volumetric analysis | | *OTHER:* | Quantitative | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 83. A student weighs out 0.556 g of KHP (molar mass = 204.22 g/mol) and titrates to the equivalence point with 36.78 mL of a stock NaOH solution. What is the concentration of the stock NaOH solution? KHP is an acid with one acidic proton.   |  |  |  | | --- | --- | --- | |  | a. | 0.00272 *M* | |  | b. | 0.100 *M* | |  | c. | 0.0151 *M* | |  | d. | 0.0740 *M* | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 4.8 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | True | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | quantitative analysis | volumetric analysis | | *OTHER:* | Quantitative | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 84. A chemical that changes color at the endpoint of a reaction is called a colorimeter.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.8 | | *QUESTION TYPE:* | True / False | | *HAS VARIABLES:* | False | | *KEYWORDS:* | acid-base reaction | chemical reactions | Chemistry | general chemistry | neutralization reaction | types of chemical reactions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 85. In which of the following does nitrogen have an oxidation state of +4?   |  |  |  | | --- | --- | --- | |  | a. | HNO3 | |  | b. | NO2 | |  | c. | N2O | |  | d. | NH4Cl | |  | e. | NaNO2 |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.9 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | assigning oxidation number | chemical reactions | Chemistry | general chemistry | oxidation-reduction reaction | types of chemical reactions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 86. The oxidation state of iodine in IO3– is:   |  |  |  | | --- | --- | --- | |  | a. | 0 | |  | b. | +3 | |  | c. | –3 | |  | d. | +5 | |  | e. | –5 |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.9 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | assigning oxidation number | chemical reactions | Chemistry | general chemistry | oxidation-reduction reaction | types of chemical reactions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 87. The oxidation state of chlorine in ClO3– is:   |  |  |  | | --- | --- | --- | |  | a. | 0 | |  | b. | +5 | |  | c. | –5 | |  | d. | +7 | |  | e. | –7 |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.9 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | True | | *KEYWORDS:* | assigning oxidation number | chemical reactions | Chemistry | general chemistry | oxidation-reduction reaction | types of chemical reactions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/29/2017 12:01 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 88. Which of the following statements is *not* true?   |  |  |  | | --- | --- | --- | |  | a. | When a metal reacts with a nonmetal, an ionic compound is formed. | |  | b. | A metal-nonmetal reaction can always be assumed to be an oxidation-reduction reaction. | |  | c. | Two nonmetals can undergo an oxidation-reduction reaction. | |  | d. | When two nonmetals react, the compound formed is ionic. | |  | e. | A metal-nonmetal reaction involves electron transfer. |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.9 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | oxidation-reduction reaction | types of chemical reactions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 89. In the reaction 2Ca(*s*) + O2(*g*) → 2CaO(*s*), which species is oxidized?   |  |  |  | | --- | --- | --- | |  | a. | O2 | |  | b. | O2– | |  | c. | Ca | |  | d. | Ca2+ | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.9 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | oxidation-reduction reaction | types of chemical reactions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 90. In the reaction 2Cs(s) + Cl2(g) → 2CsCl(s), Cl2 is   |  |  |  | | --- | --- | --- | |  | a. | the reducing agent | |  | b. | the oxidizing agent | |  | c. | oxidized | |  | d. | the electron donor | |  | e. | two of these |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.9 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | oxidation-reduction reaction | types of chemical reactions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 91. In the reaction N2(g) + 3H2(g) → 2NH3(g), N2 is   |  |  |  | | --- | --- | --- | |  | a. | oxidized | |  | b. | reduced | |  | c. | the electron donor | |  | d. | the reducing agent | |  | e. | two of these |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.9 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | oxidation-reduction reaction | types of chemical reactions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 92. In the reaction P4(s) + 10Cl2(g) → 4PCl5(s), the reducing agent is   |  |  |  | | --- | --- | --- | |  | a. | chlorine | |  | b. | PCl5 | |  | c. | phosphorus | |  | d. | Cl– | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.9 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | oxidation-reduction reaction | types of chemical reactions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 93. In the reaction C(s) + O2(g) → CO2(g) carbon is \_\_\_\_\_\_\_\_\_\_.   |  |  |  | | --- | --- | --- | |  | a. | the reducing agent | |  | b. | the electron acceptor | |  | c. | reduced | |  | d. | the oxidizing agent | |  | e. | more than one of these |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.9 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | oxidation-reduction reaction | types of chemical reactions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 94. Which of the following reactions does *not* involve oxidation-reduction?   |  |  |  | | --- | --- | --- | |  | a. | CH4 + 3O2 → 2H2O + CO2 | |  | b. | Zn + 2HCl → ZnCl2 + H2 | |  | c. | 2Na + 2H2O → 2NaOH + H2 | |  | d. | MnO2 + 4HCl → Cl2 + 2H2O + MnCl2 | |  | e. | All are oxidation-reduction reactions. |  |  |  | | --- | --- | | *ANSWER:* | e | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.9 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | oxidation-reduction reaction | types of chemical reactions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 95. Which of the following are oxidation-reduction reactions?   |  |  | | --- | --- | | I. | PCl3 + Cl2 → PCl5 | | II. | Cu + 2AgNO3 → Cu(NO3)2 + 2Ag | | III. | CO2 + 2LiOH → Li2CO3 + H2O | | IV. | FeCl2 + 2NaOH → Fe(OH)2 + 2NaCl |  |  |  |  | | --- | --- | --- | |  | a. | III | |  | b. | IV | |  | c. | I and II | |  | d. | I, II, and III | |  | e. | I, II, III, and IV |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.9 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | oxidation-reduction reaction | types of chemical reactions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 96. Which of the following statements is(are) *true*? Oxidation and reduction   |  |  |  | | --- | --- | --- | |  | a. | cannot occur independently of each other | |  | b. | accompany all chemical changes | |  | c. | describe the loss and gain of electron(s), respectively | |  | d. | result in a change in the oxidation states of the species involved | |  | e. | A, C, and D |  |  |  | | --- | --- | | *ANSWER:* | e | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.9 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | oxidation-reduction reaction | types of chemical reactions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 97. In the reaction Zn + H2SO4 → ZnSO4 + H2, which, if any, element is oxidized?   |  |  |  | | --- | --- | --- | |  | a. | zinc | |  | b. | hydrogen | |  | c. | sulfur | |  | d. | oxygen | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.9 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | oxidation-reduction reaction | types of chemical reactions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 98. In the following reaction, which species is oxidized?           8NaI + 5H2SO4 → 4I2 + H2S + 4Na2SO4 + 4H2O   |  |  |  | | --- | --- | --- | |  | a. | sodium | |  | b. | iodine | |  | c. | sulfur | |  | d. | hydrogen | |  | e. | oxygen |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.9 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | oxidation-reduction reaction | types of chemical reactions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 99. How many of the following are oxidation-reduction reactions?           NaOH + HCl → NaCl + H2O           Cu + 2AgNO3 → 2Ag + Cu(NO3)2           Mg(OH)2 → MgO + H2O           N2 + 3H2 → 2NH3   |  |  |  | | --- | --- | --- | |  | a. | 0 | |  | b. | 1 | |  | c. | 2 | |  | d. | 3 | |  | e. | 4 |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.9 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | oxidation-reduction reaction | types of chemical reactions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 100. In the reaction shown below, what species is oxidized?                2NaI + Br2 → 2NaBr + I2   |  |  |  | | --- | --- | --- | |  | a. | Na+ | |  | b. | I– | |  | c. | Br2 | |  | d. | Br– | |  | e. | I2 |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.9 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | oxidation-reduction reaction | types of chemical reactions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 101. Oxidation is the gain of electrons.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | False | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.9 | | *QUESTION TYPE:* | True / False | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | oxidation-reduction reaction | types of chemical reactions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 102. A reducing agent is an electron donor.   |  |  |  | | --- | --- | --- | |  | a. | True | |  | b. | False |  |  |  | | --- | --- | | *ANSWER:* | True | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.9 | | *QUESTION TYPE:* | True / False | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | oxidation-reduction reaction | types of chemical reactions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 103. Balance the following oxidation-reduction reaction using the oxidation number method:                Fe3+ + I– → Fe2+ + I2 In the balanced equation, the coefficient of Fe2+ is   |  |  |  | | --- | --- | --- | |  | a. | 1 | |  | b. | 2 | |  | c. | 3 | |  | d. | 4 | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.1 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | balancing oxidation-reduction equations | chemical reactions | Chemistry | general chemistry | oxidation number method | types of chemical reactions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 104. Balance the following oxidation-reduction reaction using the oxidation number method:                 Cr + Cl2 → Cr3+ + Cl–  In the balanced equation, the coefficient of Cl– is   |  |  |  | | --- | --- | --- | |  | a. | 2 | |  | b. | 3 | |  | c. | 4 | |  | d. | 6 | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.1 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | True | | *KEYWORDS:* | balancing oxidation-reduction equations | chemical reactions | Chemistry | general chemistry | oxidation number method | types of chemical reactions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 105. Consider the following unbalanced oxidation-reduction reaction:                 Fe2+ + Cl2 → Fe3+ + Cl–  In the balanced equation, the number of electrons transferred is   |  |  |  | | --- | --- | --- | |  | a. | 1 | |  | b. | 3 | |  | c. | 2 | |  | d. | 4 | |  | e. | none of these |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.1 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | True | | *KEYWORDS:* | balancing oxidation-reduction equations | chemical reactions | Chemistry | general chemistry | oxidation number method | types of chemical reactions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 106. The MnO4– is often used to analyze for the Fe2+ content of an aqueous solution via the reaction MnO4–(*aq*) + Fe2+(*aq*) + H+(*aq*) → Fe3+(*aq*) + Mn2+(*aq*) + H2O(*l*) What is the ratio of Fe2+ : MnO4– in the balanced equation?   |  |  |  | | --- | --- | --- | |  | a. | 1 : 1 | |  | b. | 2 : 1 | |  | c. | 3 : 1 | |  | d. | 4 : 1 | |  | e. | 5 : 1 |  |  |  | | --- | --- | | *ANSWER:* | e | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 4.1 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | balancing oxidation-reduction equations | chemical reactions | Chemistry | general chemistry | oxidation number method | types of chemical reactions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 107. Given the reaction:                2MnO4– + 5H2O2 + 6H+ → 2Mn2+ + 8H2O + 5O2 determine the number of electrons involved in this reaction.   |  |  |  | | --- | --- | --- | |  | a. | 10 | |  | b. | 8 | |  | c. | 6 | |  | d. | 4 | |  | e. | 2 |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.1 | | *QUESTION TYPE:* | Multi-Mode (Multiple choice) | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | oxidation-reduction reaction | types of chemical reactions | | *OTHER:* | Quantitative | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 108. A molecule with an unequal charge distribution is said to be a \_\_\_\_\_\_\_\_\_\_ molecule.   |  |  | | --- | --- | | *ANSWER:* | polar | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.1 | | *QUESTION TYPE:* | Subjective Short Answer | | *HAS VARIABLES:* | False | | *KEYWORDS:* | Chemistry | general chemistry | solution formation | solutions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 109. Soluble ionic compounds containing the hydroxide ion are called strong \_\_\_\_\_\_\_\_\_\_.   |  |  | | --- | --- | | *ANSWER:* | bases | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.2 | | *QUESTION TYPE:* | Subjective Short Answer | | *HAS VARIABLES:* | False | | *KEYWORDS:* | acid-base reaction | base definition | chemical reactions | Chemistry | general chemistry | types of chemical reactions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 110. A \_\_\_\_\_\_\_\_\_\_ is a substance dissolved in a liquid to make a solution.   |  |  | | --- | --- | | *ANSWER:* | solute | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.2 | | *QUESTION TYPE:* | Subjective Short Answer | | *HAS VARIABLES:* | False | | *KEYWORDS:* | Chemistry | general chemistry | solution formation | solutions | types of solutions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 111. A \_\_\_\_\_\_\_\_\_\_ electrolyte dissociates to a great extent in an aqueous solution.   |  |  | | --- | --- | | *ANSWER:* | strong | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.2 | | *QUESTION TYPE:* | Subjective Short Answer | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | electrolyte | general chemistry | ions in aqueous solution | strong electrolyte | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 112. Molarity is defined as \_\_\_\_\_\_\_\_\_\_ of solute per volume of solution in \_\_\_\_\_\_\_\_\_\_\_.   |  |  | | --- | --- | | *ANSWER:* | moles, liters | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.3 | | *QUESTION TYPE:* | Subjective Short Answer | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | concentration | general chemistry | working with solutions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Selecting from the following reagents, indicate which reagents would be mixed to give the compounds described.   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | CuSO4(*aq*) |  | Fe2(CO3)3(*s*) | NH3(*aq*) | |  | CuCO3(*s*) |  | FeCl3(*aq*) | Na2SO4(*aq*) | |  | Cr(OH)3(*s*) |  | H2SO4(*aq*) |  | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 113. Cu(OH)2(*s*)   |  |  | | --- | --- | | *ANSWER:* | CuSO4(*aq*) and NH3(*aq*) | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 4.6 | | *QUESTION TYPE:* | Subjective Short Answer | | *HAS VARIABLES:* | False | | *PREFACE NAME:* | Ref 4-3 | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | precipitation reaction | types of chemical reactions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 114. FeCl3(*aq*) + Na2SO4(*aq*)   |  |  | | --- | --- | | *ANSWER:* | FeCl3(*aq*) + Na2SO4(*aq*) | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.6 | | *QUESTION TYPE:* | Subjective Short Answer | | *HAS VARIABLES:* | False | | *PREFACE NAME:* | Ref 4-3 | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | precipitation reaction | types of chemical reactions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Write balanced equations for each of the processes, choosing from the following substances as reactants:   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | |  | BaCl2 |  | O2 | H2SO4 | HNO3 | |  | C2H5OH |  | H2O | Ca(OH)2 | K | |  | Na2CrO4 |  | KOH | Pb(NO3)2 | | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 115. Precipitation of BaSO4 from solution   |  |  | | --- | --- | | *ANSWER:* | H2SO4 + BaCl2 → BaSO4 + 2HCl | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 4.6 | | *QUESTION TYPE:* | Subjective Short Answer | | *HAS VARIABLES:* | False | | *PREFACE NAME:* | Ref 4-4 | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | precipitation reaction | types of chemical reactions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 116. Neutralization of sulfuric acid   |  |  | | --- | --- | | *ANSWER:* | H2SO4 + 2KOH → K2SO4 + 2H2O  or H2SO4 + Ca(OH)2 → CaSO4 + 2H2O | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 4.8 | | *QUESTION TYPE:* | Subjective Short Answer | | *HAS VARIABLES:* | False | | *PREFACE NAME:* | Ref 4-4 | | *KEYWORDS:* | acid-base reaction | chemical reactions | Chemistry | general chemistry | types of chemical reactions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 117. Combustion reaction   |  |  | | --- | --- | | *ANSWER:* | C2H5OH + 3O2 → 2CO2 + 3H2O | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 4.9 | | *QUESTION TYPE:* | Subjective Short Answer | | *HAS VARIABLES:* | False | | *PREFACE NAME:* | Ref 4-4 | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | oxidation-reduction reaction | types of chemical reactions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 118. Dissolution of calcium hydroxide with another reagent   |  |  | | --- | --- | | *ANSWER:* | Ca(OH)2 + 2HNO3 → Ca(NO3)2 + 2H2O | | *POINTS:* | 1 | | *DIFFICULTY:* | Difficult | | *REFERENCES:* | 4.8 | | *QUESTION TYPE:* | Subjective Short Answer | | *HAS VARIABLES:* | False | | *PREFACE NAME:* | Ref 4-4 | | *KEYWORDS:* | acid-base reaction | chemical reactions | Chemistry | general chemistry | types of chemical reactions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 119. Formation of hydrogen gas   |  |  | | --- | --- | | *ANSWER:* | 2K + H2O → 2KOH + H2 | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 4.9 | | *QUESTION TYPE:* | Subjective Short Answer | | *HAS VARIABLES:* | False | | *PREFACE NAME:* | Ref 4-4 | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | oxidation-reduction reaction | types of chemical reactions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 120. Balance the following equation: C3H5(NO3)3 → N2 + CO2 + H2O + O2   |  |  | | --- | --- | | *ANSWER:* | 4C3H5(NO3)3 → 6N2 + 12CO2 + 10H2O + O2 | | *POINTS:* | 1 | | *DIFFICULTY:* | Difficult | | *REFERENCES:* | 4.1 | | *QUESTION TYPE:* | Subjective Short Answer | | *HAS VARIABLES:* | False | | *KEYWORDS:* | balancing oxidation-reduction equations | chemical reactions | Chemistry | general chemistry | oxidation number method | types of chemical reactions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 121. Balance the following equation: KI + HNO3 → KNO3 + NO + I2 + H2O   |  |  | | --- | --- | | *ANSWER:* | 6KI + 8HNO3 → 6KNO3 + 2NO + 3I2 + 4H2O | | *POINTS:* | 1 | | *DIFFICULTY:* | Moderate | | *REFERENCES:* | 4.1 | | *QUESTION TYPE:* | Subjective Short Answer | | *HAS VARIABLES:* | False | | *KEYWORDS:* | balancing oxidation-reduction equations | chemical reactions | Chemistry | general chemistry | oxidation number method | types of chemical reactions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 122. Select the spectator ions for the following reaction, Pb(NO3)2 + 2 KCl → PbCl2 + 2 KNO3   |  |  |  | | --- | --- | --- | |  | a. | K+(aq), NO3-(aq) | |  | b. | Pb2+(aq), NO3-(aq) | |  | c. | K+(aq), Cl-(aq) | |  | d. | Pb2+(aq), Cl -(aq), K+(aq), NO3-(aq) | |  | e. | Pb2+(aq), Cl -(aq) |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.6 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | ionic equation | ions in aqueous solution | net ionic equation | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/6/2017 5:23 AM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 123. Select the spectator ions for the following reaction in aqueous solution, AgNO3 + LiI → AgI + LiNO3   |  |  |  | | --- | --- | --- | |  | a. | Li+(aq), NO3-(aq) | |  | b. | Ag+(aq), NO3-(aq) | |  | c. | Li+(aq), I-(aq) | |  | d. | Ag+(aq), I -(aq), Li+(aq), NO3-(aq) | |  | e. | Ag+(aq), I -(aq) |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.6 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | ionic equation | ions in aqueous solution | net ionic equation | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 2/3/2017 4:30 AM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 124. Complete the following reaction in aqueous solution and select the spectator ions, Fe(NO3)2 + (NH4)2CO3 →   |  |  |  | | --- | --- | --- | |  | a. | Fe2+(aq), NO3-(aq) | |  | b. | NH4+(aq), NO3-(aq) | |  | c. | NH4+(aq), CO32-(aq) | |  | d. | Fe2+(aq), NH4+(aq), NO3-(aq), CO32-(aq) | |  | e. | Fe2+(aq), CO32-(aq) |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.6 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | ionic equation | ions in aqueous solution | net ionic equation | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 125. Identify the precipitate(s) formed (if any) in the following reaction in aqueous solution, Fe(NO3)2 + (NH4)2CO3 →   |  |  |  | | --- | --- | --- | |  | a. | Fe2(CO3)3 | |  | b. | FeCO3(s) | |  | c. | (NH4)2CO3(s) | |  | d. | NH4NO3(s) | |  | e. | No precipitate will be observed |  |  |  | | --- | --- | | *ANSWER:* | b | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.6 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | ionic equation | ions in aqueous solution | net ionic equation | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 126. Which of the following ions forms the fewest insoluble salts?   |  |  |  | | --- | --- | --- | |  | a. | Al3+ | |  | b. | Cl– | |  | c. | NO3– | |  | d. | OH– | |  | e. | Mg2+ |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.5 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | ions in aqueous solution | solubility rules | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 127. Which of the following ions forms the fewest insoluble salts?   |  |  |  | | --- | --- | --- | |  | a. | Al3+ | |  | b. | Cl– | |  | c. | NH4+ | |  | d. | OH– | |  | e. | Mg2+ |  |  |  | | --- | --- | | *ANSWER:* | c | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.5 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | chemical reactions | Chemistry | general chemistry | ions in aqueous solution | solubility rules | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 128. In which of the following does nitrogen have the highest oxidation state?   |  |  |  | | --- | --- | --- | |  | a. | HNO3 | |  | b. | NO2 | |  | c. | N2O | |  | d. | NH4Cl | |  | e. | NaNO2 |  |  |  | | --- | --- | | *ANSWER:* | a | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.9 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | assigning oxidation number | chemical reactions | Chemistry | general chemistry | oxidation-reduction reaction | types of chemical reactions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 129. In which of the following does nitrogen have the lowest oxidation state?   |  |  |  | | --- | --- | --- | |  | a. | HNO3 | |  | b. | NO2 | |  | c. | N2O | |  | d. | NH4Cl | |  | e. | NaNO2 |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.9 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | assigning oxidation number | chemical reactions | Chemistry | general chemistry | oxidation-reduction reaction | types of chemical reactions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 130. In which of the following does iodine have the lowest oxidation state?   |  |  |  | | --- | --- | --- | |  | a. | LiIO3 | |  | b. | IO2 | |  | c. | I2O | |  | d. | NH4I | |  | e. | I2 |  |  |  | | --- | --- | | *ANSWER:* | d | | *POINTS:* | 1 | | *DIFFICULTY:* | Easy | | *REFERENCES:* | 4.9 | | *QUESTION TYPE:* | Multiple Choice | | *HAS VARIABLES:* | False | | *KEYWORDS:* | assigning oxidation number | chemical reactions | Chemistry | general chemistry | oxidation-reduction reaction | types of chemical reactions | | *OTHER:* | Conceptual | | *DATE CREATED:* | 3/4/2016 4:34 PM | | *DATE MODIFIED:* | 3/4/2016 4:34 PM | |