Name : _____ Date : _____

Molality Worksheet

1. What is the molality of a solution in which 3.0 moles of NaCl is dissolved in 1.5 kg of water?

2. What is the molality of a solution in which 25 g of NaCl is dissolved in 2.0 kg of water?

3. What is the molality of a solution in which 15 g of I_2 is dissolved in 500 g of alcohol?

4. How many grams of I_2 (solute) should be added to 750 g of CCl_4 (solvent) to prepare a 0.020 m solution?

5. How much water (solvent) should be added to 5.00 g of KCl to prepare a 0.500 m solution?

6. 326 g of C_6H_6 dissolve in 820 g of acetone. What is the molality?

7. What mass of glucose must dissolve in 400 g of ethanol to make a 1.6 m solution?

8. What mass of ethanol is 360 g of sucrose dissolved in to make a 1.6 m solution? If the density of ethanol is 0.89 g/mL, determine the volume of ethanol used.

9. What is the molality of a solution that contains 80.0 g $Al_2(SO_4)_3$ in 625 g H_2O?

10. What mass of water is required to dissolve 175 g KNO_3 to produce a 2.25 m solution?

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Molality Worksheet

Answers

1. What is the molality of a solution in which 3.0 moles of NaCl is dissolved in 1.5 kg of water?

   Molality = 3.0 mol/1.5 kg = 2.0 m

2. What is the molality of a solution in which 25 g of NaCl is dissolved in 2.0 kg of water?

   Molality = (25 g x 1 mol/58.5 g)/2.0 kg = 0.22 m

3. What is the molality of a solution in which 15 g of I_2 is dissolved in 500 g of alcohol?

   Molality = (15 g x 1 mol/253.81 g)/0.500 kg = 0.12 m

4. How many grams of I_2 (solute) should be added to 750 g of CCl_4 (solvent) to prepare a 0.020 m solution?

   Moles of I_2 = 0.020 m x 0.750 kg = 0.015 mol

   Mass of I_2 = 0.015 mol x 253.81 g/mol = 3.8 g

5. How much water (solvent) should be added to 5.00 g of KCl to prepare a 0.500 m solution?

   Moles of KCl = 5 g x 1 mol/74.5 g = 0.067 mol

   Mass of water = 0.067 mol /0.500 m = 0.134 kg

6. 326 g of C_6H_6 dissolve in 820 g of acetone. What is the molality?

   Molality = (326 g x 1 mol/78 g)/0.820 kg = 5.1 m

7. What mass of glucose must dissolve in 400 g of ethanol to make a 1.6 m solution?

   Mass of $C_6H_{12}O_6$ = 1.6 m x 0.400 kg x 180 g/mol = 115.2 g

8. What mass of ethanol is 360 g of sucrose dissolved in to make a 1.6 m solution? If the density of ethanol is 0.89 g/mL, determine the volume of ethanol used.

   Mass of ethanol = (360 g x 1 mol/342.2 g)/1.6 m = 0.656 kg

   Volume of ethanol = 656 g/0.89 g/mL = 737 mL

9. What is the molality of a solution that contains 80.0 g $Al_2(SO_4)_3$ in 625 g H_2O?

   Molarity = (80.0 g x 1 mol/342.14 g)/0.625 kg = 0.374 m

10. What mass of water is required to dissolve 175 g KNO_3 to produce a 2.25 m solution?

    Mass of water = (175 g x 1 mol/101.1 g)/2.25 m = 0.769 kg