Name : _____ Date : _____

Molality and Molarity

1. What is the molality of 0.3 mol of NaCl in 0.200 kg of H_2O?

2. What is the molality of 3 moles KI in 0.500 kg of H_2O?

3. How many moles of BaI_2 are in 0.300 kg of H_2O if the molality is 0.2 m?

4. How many moles of BaI_2 are present in 0.150 kg of H_2O if the concentration is 0.3 m?

5. What is the molality of a solution in which 0.32 moles of $AlCl_3$ has been dissolved in 2,200 g of water?

6. What mass of water is needed to prepare a 1.2 molal solution using 0.60 mol propylene glycol?

7. What is the molality of a solution in which 0.145 mol CO_2 (molar mass = 44.01 g/mol) is dissolved in 591 g water?

8. What is the molality of a solution in which 13.7 g of NaCl has been dissolved in 500 g of water?

9. How many grams of ethanol, C_2H_5OH (molar mass = 46.08 g/mol), are needed to prepare a 0.1 molal solution using 1.000 kg water?

10. You want 85 g of KOH (molar mass = 56.11 g/mol). How much of a 3.0 m solution of KOH will provide it?

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Answers

1. What is the molality of 0.3 mol of NaCl in 0.200 kg of H_2O?

   Molality = 0.3 mol/0.2 kg = 1.5 m

2. What is the molality of 3 moles KI in 0.500 kg of H_2O?

   Molality = 3 mol/0.5000 kg = 6 m

3. How many moles of BaI_2 are in 0.300 kg of H_2O if the molality is 0.2 m?

   Moles of BaI_2 = 0.2 m x 0.300 kg = 0.06 mol

4. How many moles of BaI_2 are present in 0.150 kg of H_2O if the concentration is 0.3 m?

   Moles of BaI_2 = 0.3 m x 0.150 kg = 0.045 mol

5. What is the molality of a solution in which 0.32 moles of $AlCl_3$ has been dissolved in 2,200 g of water?

   Molality = 0.32 mol/2.2 kg = 0.145 m

6. What mass of water is needed to prepare a 1.2 molal solution using 0.60 mol propylene glycol?

   Mass = 0.6 mol/1.2 m = 0.5 kg

7. What is the molality of a solution in which 0.145 mol CO_2 (molar mass = 44.01 g/mol) is dissolved in 591 g water?

   Molality = 0.145 mol/0.591 kg = 0.25 m

8. What is the molality of a solution in which 13.7 g of NaCl has been dissolved in 500 g of water?

   Molality = (13.7 g NaCl x 1 mol/58.5 g NaCl)/0.500 kg = 0.46 m

9. How many grams of ethanol, C_2H_5OH (molar mass = 46.08 g/mol), are needed to prepare a 0.1 molal solution using 1.000 kg water?

   Mass = 0.1 m x 1.000 kg x 46.08 g/mol = 4.608 g

10. You want 85 g of KOH (molar mass = 56.11 g/mol). How much of a 3.0 m solution of KOH will provide it?

    Mass = 85 g KOH x (1 mol KOH/56.11 g KOH) x (1 kg solvent/3 mol KOH) = 0.500 kg solvent or 500 g

    500 g solvent + 85 g KOH = 585 g solution.