Name : _____   Date : _____

Molarity and Dilution Worksheet

1. 40.0 mL of 0.400 M NaOH solution is diluted to a final volume of 200.0 mL. Calculate the new concentration.

2. A solution of 85.0 mL of NaOH is diluted to a final volume of 290.0 mL, and the new molarity is 0.0500 M. Calculate the original molarity of the base.

3. 150.0 mL of 0.025 M NaOH solution is added to 150.0 mL of water. Calculate the new molarity.

4. 220.0 mL of a solution of NaOH is diluted by adding 250.0 mL of water to produce a new molarity of 0.0500 M. Calculate the molarity of the base.

5. A 0.350 M solution is concentrated by evaporation to a reduced final volume of 100.0 mL and molarity of 0.825 M. Calculate the original volume.

6. 850.0 mL of 0.280 M KOH solution is diluted to a final volume of 1000.0 mL. Calculate the new concentration.

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Answers

1. 40.0 mL of 0.400 M NaOH solution is diluted to a final volume of 200.0 mL. Calculate the new concentration.

   $M_1V_1 = M_2V_2$

   => $(0.400)(40.0) = M_2(200.0)$

   => $M_2 = 0.0800$ M

2. A solution of 85.0 mL of NaOH is diluted to a final volume of 290.0 mL, and the new molarity is 0.0500 M. Calculate the original molarity of the base.

   $M_1V_1 = M_2V_2$

   => $M_1(85.0) = (0.0500)(290.0)$

   => $M_1 = 0.171$ M

3. 150.0 mL of 0.025 M NaOH solution is added to 150.0 mL of water. Calculate the new molarity.

   $M_1V_1 = M_2V_2$

   => $(0.025)(150.0) = M_2(300.0)$

   => $M_2 = 0.013$ M

4. 220.0 mL of a solution of NaOH is diluted by adding 250.0 mL of water to produce a new molarity of 0.0500 M. Calculate the molarity of the base.

   $M_1V_1 = M_2V_2$

   => $M_1(220.0) = (0.0500)(470.0)$

   => $M_1 = 0.107$ M

5. A 0.350 M solution is concentrated by evaporation to a reduced final volume of 100.0 mL and molarity of 0.825 M. Calculate the original volume.

   $M_1V_1 = M_2V_2$

   => $(0.350)V_1 = (0.825)(100.0)$

   => $V_1 = 236$ mL

6. 850.0 mL of 0.280 M KOH solution is diluted to a final volume of 1000.0 mL. Calculate the new concentration.

   $M_1V_1 = M_2V_2$

   => $(0.280)(850.0) = M_2(1000.0)$

   => $M_2 = 0.238$ M