

MOLARITY BY DILUTION

79+52 = 132 Name _____

Acids are usually acquired from chemical supply houses in concentrated form. These acids are diluted to the desired concentration by adding water. Since moles of acid before dilution = moles of acid after dilution, and moles of acid = $M \times V$ then, $M_1 \times V_1 = M_2 \times V_2$. Solve the following problems.

1. How much concentrated 18 M sulfuric acid is needed to prepare 250 mL of a 6.0 M solution?

$$V_1 = \frac{M_2 V_2}{M_1} = \frac{(6.0 \text{ M})(250 \text{ mL})}{18 \text{ M}}$$

83 mL

2. How much concentrated 12 M hydrochloric acid is needed to prepare 100 mL of a 2.0 M solution?

$$V_1 = \frac{M_2 V_2}{M_1} = \frac{(2.0 \text{ M})(100 \text{ mL})}{12 \text{ M}}$$

17 mL

3. To what volume should 25 mL of 15 M nitric acid be diluted to prepare a 3.0 M solution?

$$V_2 = \frac{M_1 V_1}{M_2} = \frac{(15 \text{ M})(25 \text{ mL})}{3.0 \text{ M}}$$

125 mL

4. To how much water should 50 mL of 12 M hydrochloric acid be added to produce a 4.0 M solution?

$$V_2 = \frac{M_1 V_1}{M_2} = \frac{(12 \text{ M})(50 \text{ mL})}{4.0 \text{ M}} = 150 \text{ mL} - 50 \text{ mL}$$

100 mL H₂O

5. To how much water should 100 mL of 18 M sulfuric acid be added to prepare a 1.5 M solution?

$$V_2 = \frac{M_1 V_1}{M_2} = \frac{(18 \text{ M})(100 \text{ mL})}{1.5 \text{ M}} = 1200 \text{ mL} - 100 \text{ mL} = 1100 \text{ mL}$$

1.1 L

Molarity Practice Answer Key

SJ Ball



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