

Name: _____

Date: _____

Molarity and Concentration Quiz

1. What concentration would you get in moles per liter if you dissolved 35.6g of salt (NaCl) in 3.25 liters of water?

$$\frac{35.6 \text{ g}}{58.5 \text{ g/mol}} = 0.609 \text{ mol} \quad \frac{0.609 \text{ mol}}{3.25 \text{ L}} = 0.187 \text{ M}$$

2. What concentration would you get in moles per liter if you dissolved 2.5g of HCL in 0.525ml of water?

$$\frac{2.5 \text{ g}}{36.5 \text{ g/mol}} = 0.0685 \text{ mol} \quad \frac{0.0685 \text{ mol}}{0.000525 \text{ L}} = 130 \text{ M}$$

3. What concentration would you get in moles per liter if you dissolved 125g of Calcium hydroxide [Ca(OH)₂] in 0.75 liters of water?

$$\frac{125 \text{ g}}{74.1 \text{ g/mol}} = 1.687 \text{ mol} \quad \frac{1.687 \text{ mol}}{0.75 \text{ L}} = 2.25 \text{ M}$$

4. What concentration would you get in moles per liter if you dissolved 1.25 moles of KOH in 1200 milliliters of water?

$$\frac{1.25 \text{ mol}}{1.200 \text{ L}} = 1.04 \text{ M}$$

5. What concentration would you get in moles per liter if you dissolved 3.1×10^{-1} moles of calcium carbonate (CaCO₃) in 400 milliliters of water?

$$\frac{3.1 \times 10^{-1} \text{ mol}}{0.4 \text{ L}} = 0.775 \text{ M}$$

6. What concentration would you get in moles per liter if you dissolved 3.5 moles of RbClO in 1.2 liters of water?

$$3.5 \text{ mol} / 1.2 \text{ L} = 2.92 \text{ M}$$

7. If you needed to make 625 ml of a 2M solution of MgCl_2 , how many grams of magnesium chloride would you need?

$$\text{mol} = M \times V$$

$$= 2 \text{ M} \times 0.625 \text{ L} = 1.25 \text{ mol} \times 95.3 \text{ g/mol} = 119 \text{ g}$$

8. If a manufacturing process required 1.75 liters of a 0.75 M salt solution, how many moles would you need to make this solution?

$$0.75 \text{ M} \times 1.75 \text{ L} = 1.31 \text{ mol}$$

9. A 750 ml can of 2.25M HCl holds how many moles ^{of} the acid?

$$\text{mol} = M \times V$$

$$= 2.25 \text{ M} \times 0.75 \text{ L} = 1.69 \text{ mol}$$

10. What volume of a 0.025 M solution NaCl would you measure out if you wanted to get 1/3 of a mole of solute when evaporated dry?

$$V = \frac{\text{mol}}{M} = \frac{0.333 \text{ mol}}{0.025 \text{ M}} = 13.32 \text{ L}$$

11. If you needed to neutralize one mole of base with some 0.125M acid, how much volume of acid would you need to measure out to equal 1 mole?

$$V = \frac{\text{mol}}{M} = \frac{1 \text{ mol}}{0.125} = 8 \text{ L}$$

12. How much 1.5M FeCl_2 solution would I need to measure out to get 100 grams of iron II chloride?

$$\text{FeCl}_2 = 55.8 \text{ g} + 71 \text{ g} = 126.8 \text{ g/mol}$$

$$100 \text{ g} / 126.8 \text{ g/mol} = 0.789 \text{ mol}$$

$$\frac{0.789 \text{ mol}}{1.5 \text{ M}} = 0.526 \text{ L}$$