

Concentration (18.2-18.3)

$$\text{Molarity} - (M) = \frac{\text{moles solute}}{\text{L solution}}$$

↓
(solute + solvent)

∴ solute = solution
like dissolves like
→ increases surface area

Say "1 molar NaCl"

Intrinsic Property - not based on amount (like density)

① $M = \frac{\text{mol}}{\text{L}}$

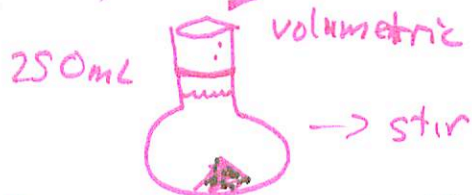
② $M \cdot \text{L} = \text{mol}$

③ $\frac{\text{mol}}{M} = \text{L}$

Prob 1: You need 250. mL of 1.25 M NaCl. How many grams NaCl do you need?

$$\frac{1.25 \text{ mol}}{\text{L}} \left(\frac{0.250 \text{ L}}{1} \right) = 0.313 \text{ mol NaCl} \left(\frac{58.44 \text{ g}}{1 \text{ mol NaCl}} \right) =$$

18.3 g
NaCl



Prob 2: You put 10g of NaCl in water to make 50. mL of solution. Find M.

$$10 \text{ g} \left(\frac{1 \text{ mol}}{58.44 \text{ g}} \right) = \frac{0.17 \text{ mol NaCl}}{0.050 \text{ L}} = \boxed{3.4 \text{ M NaCl}}$$

**Chapter
Test****Nuclear Changes****I. Testing Concepts**

Directions: In the blank at the left, write the letter of the term or phrase that best completes the statement or answers the question.

- _____ 1. The type of radioactive particle that can be stopped by a sheet of paper is the _____.
a. gamma ray b. beta particle c. alpha particle d. all of these
- _____ 2. The most penetrating type of radiation is the _____.
a. gamma ray b. beta particle c. alpha particle d. none of these
- _____ 3. The type of radiation detector that works when a charged particle ionizes a gas that allows a current to flow and causes a speaker to click is a(n) _____.
a. bubble chamber c. Geiger counter
b. cloud chamber d. electroscopes
- _____ 4. A helium nucleus with two protons and two neutrons is called a(n) _____.
a. gamma ray c. beta particle
b. alpha particle d. electroscopes
- _____ 5. The largest source of background radiation is _____.
a. cosmic rays c. trees
b. building materials d. radon gas
- _____ 6. Carbon-14 is useful for dating fossils that are _____.
a. more than 50,000 years old c. less than 50,000 years old
b. from animals only d. from plants only
- _____ 7. An instrument that detects radiation with water vapor or ethanol vapor.
a. photographic plate c. Geiger counter
b. cloud chamber d. bubble chamber
- _____ 8. Negatively charged particles emitted from a nucleus at a high speed are _____.
a. alpha particles b. X rays c. gamma rays d. beta particles
- _____ 9. The discovery of radioactivity by Henri Becquerel involved a _____.
a. chain reaction c. Geiger counter
b. photographic plate d. bubble chamber
- _____ 10. A radioactive isotope used to find molecules in an organism is called a(n) _____.
a. tracer b. transmutation c. ion d. electron avalanche
- _____ 11. Thorium-234 has a half-life of 24 days. If you started with a 100-gram sample of thorium-234, how much would remain after 48 days?
a. 100 grams b. 50 grams c. 25 grams d. 10 grams
- _____ 12. Each element with an atomic number greater than 84 is _____.
a. radioactive b. stable c. synthetic d. material