

### Answers to Chapter 2 Study Questions

- a) An element is a fundamental substance that cannot be broken down into simpler substances by chemical means. It is composed of atoms.

b) A compound is a pure substance made of at least two elements in a fixed ratio.

c) A pure substance can be an element or a compound. It has a constant composition.
- a) air = mixture, solution                      b) titanium = pure, element

c) oak = mixture                                      d) baking soda = pure, compound

e) oxygen = pure, element                      f) 7-Up = mixture, solution

g) wine = mixture, solution                      h) carbon monoxide = pure, compound
- a) element                      b) compound                      c) element                      d) mixture

a) and b) contain molecules.
- solid:** particles not moving and close; **liquid:** particles moving and close; **gas:** particles moving and far apart; **aqueous** (dissolved in water): particles moving and far.
- chemical:** Chlorine reacts with sodium to form NaCl. You could also list the formula of any ionic compound chlorine forms, such as  $MgCl_2$ ,  $CaCl_2$ , etc.

**physical:** Chlorine is a pale green gas at room temperature. It's a nonmetal made up of diatomic molecules.
- Chemical reactions are frequently accompanied by:

a) mass changes and/or bubbles which show that a gas is involved in the reaction.

b) heat changes; heat is evolved in exothermic reactions; heat is used up in endothermic reactions. Exothermic reactions also often result in the production of light and sound.

c) color changes which often signify a change in chemical composition.

d) the formation of a precipitate (formation of a solid from mixing solutions) which represents the formation of an insoluble substance from soluble substances.
- a) chemical                      b) physical                      c) physical                      d) chemical

e) chemical                      f) chemical                      g) physical
- a) Qualitative: This page is colorful. This page contains questions.

b) Quantitative: This page is 8.5 in x 11 in. The page contains 9 questions.

Theory: The questions on this page will be useful in studying for the test.
- a) beaker                      b) Erlenmeyer flask                      c) graduated cylinder                      d) pipet