

Elements, Compounds, and Mixtures

1. Indicate if the following is an element, compound, or a mixture.

- a) A pure substance that can only be broken down by chemical means. compound
- b) A pure substance that cannot be broken down by physical or chemical means. element
- c) Two or more substances that are combined together, where each substance retains its own chemical identity. mixture

2. Indicate if the following are elements, compounds, or mixtures.

- a) shampoo mixture
- b) a lead paperweight element
- c) skin mixture
- d) baking soda, NaHCO_3 compound
- e) air mixture
- f) copper wire element
- g) water compound
- g) sugar dissolved in coffee mixture

3. Indicate if the following are heterogeneous or homogeneous

- a) oatmeal cookie heterogeneous
- b) black coffee homogeneous
- c) tea with ice heterogeneous
- d) hot fudge sundae heterogeneous
- e) mayonnaise homogeneous
- f) shaving cream homogeneous

4. Sodium chloride has a solubility of 36.0 g NaCl/100 mL of water. If 18.0 g of sodium chloride is dissolved in 25.0 mL of water, is the solution saturated, unsaturated, or supersaturated?

Divide $18.0 \text{ g} / 25.0 \text{ mL} = 0.72 \text{ g/mL}$. This is less than the solubility of 35.0 g/mL , therefore, the solution is unsaturated.