

GENERAL CHEMISTRY 2013-14
Chapter 3 Review Worksheet

1) Be familiar with the following terms:

physical state	solid	liquid
gas	melting point	freezing point
boiling point	condensation	physical change
intensive properties	extensive properties	chemical properties
chemical changes	density	specific gravity
heterogeneous mixture	homogeneous mixture	phase
Law of Conservation of Mass	Law of Conservation of Energy	
solution	solute	solvent
concentration	percent by mass	energy
exothermic	endothermic	specific heat
calorie	joule	Calorie
alloy	sublimation	filtration
distillation		

2) Classify each of the following as a physical or chemical change:

- | | | |
|--------------------|----------------------|------------------------|
| a) boiling water | c) evaporation | e) rotting meat |
| b) burning of wood | d) rusting of a nail | f) dissolving of sugar |

- 3) A sample of a pure substance has a mass of 52.11 g. A measured amount of water has a volume of 12.5 mL. When the substance is placed in the water the volume now reads 31.8 mL. What is the density of the substance?
- 4) If the density of kerosene is 0.82 g/mL, what is the mass of 1.52 L of kerosene?
- 5) What is the volume of 485 g of table salt if the density of the salt is 2.16 g/mL?
- 6) An aqueous solution is 11.2% NaCl. What was of water is needed to make 500. g of solution?
- 7) The gold in a ring is a homogeneous mixture of metals (an alloy). If 14-K gold is 58.0% gold, what is the mass of pure gold in 4.00 oz. of 14-K gold?
- 8) A 44.0 g sample of an element absorbs 1870 J of energy and increases in temperature from 25.0 °C to 72.5 °C. What is the specific heat of the element?
- 9) A 440. g sample of a metal is heated to 100.0 °C. It is immediately placed in 285 g of water that is initially at 25.0 °C. The temperature of the water-metal mixture rises to 36.5 °C. What is the specific heat of the metal?
- 10) Determine the amount of heat (in kJ) needed to warm 1323 g of a solution from 25.0 °C to 35.0 °C. The specific heat of of the solution is 3.97 J/g*°C.
- 11) A 20.0 g sample of hot iron at 225 °C is placed in 51.0 g of water. Assume that no heat escapes to the surroundings. The water-iron mixture equilibrates at 45.0 °C. (a) How much did the temperature of the water increase? (b) What was the initial temperature f the water?
- 12) How much energy (in joules) is released when 18.5 g of copper cools from 285 °C to 45 °C? The specific heat of copper is 0.385 J/g*°C.

ANSWERS:

2) a) physical
b) chemical

c) physical
d) chemical

e) chemical
f) physical

3) 2.70 g/mL

4) 1.2×10^3 g

5) 225 mL

6) 444 g

7) 221 g

8) $0.895 \text{ J/g} \cdot ^\circ\text{C}$

9) $0.444 \text{ J/g} \cdot ^\circ\text{C}$

10) 52.5 kJ

11) a) $7.5 \text{ }^\circ\text{C}$
b) $37.5 \text{ }^\circ\text{C}$

12) 1.71×10^3 J