# Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Hour: \_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_

# AP Chemistry: *1HW*

***Directions: Complete the following problems.***

1. Explain how the difference between a *law* and a *theory* is the difference between *what* and *why*.

Classify each of the following as an element, compound, homogeneous mixture, or heterogeneous mixture.

2A. tossed salad 2B. a cup of tap water

a cup of green tea distilled water

zinc bronze

blood table salt (NaCl)

glucose copper

the Atlantic Ocean salsa

Perform each conversion, showing the conversion factor(s) in each case.

3A. Convert 6.1 millimeters to kilometers.

3B. Convert 9.1 x 105 micrometers to nanometers.

4A. Convert 72 miles per hour to meters per second. (1 mile = 1609 m)

4B. Convert 48.3 meters per second to kilometers per hour.

ANSWERS: 3A. 6.1 x 10–6 km 3B. 9.1 x 108 nm 4A. 32 m/s 4B. 174 km/h

5A. Convert 150 cm2 to m2.

5B. An inland sea holds 15,800 km3 of water. How many liters is this?

6A. A zinc-64 nuclide has a mass of about 64 atomic mass units. Convert this to kg (1 g = 6.02 x 1023 amu).

6B. The mass of an electron at rest (?!?!?) is about 9.11 x 10–28 grams. Convert this mass into amu.

7A. Portland cement concrete (PCC) has a density of 150 lb/ft3. How many kilograms of PCC are required to cast a cylindrical column 1.15 m in diameter and 7.8 m in height? (1 kg = 2.205 lb, 1 inch = 2.54 cm)

7B. A 30 L storage tank contains 6.85 kg of argon under pressure. If the gas is released into a 12-meter by

15-meter by 3.0-meter room, find the density of the argon, in g/L, once it has filled the room.

ANSWERS: 5A. 0.015 m2 6A. 1.1 x 10–25 kg 7A. 19,000 kg

5B. 1.58 x 1016 L 6B. 5.48 x 10–4 amu 7B. 0.013 g/L

8A. Silver has a density of 9.32 g/cm3. Find the length of one side of a 184 g silver cube.

8B. Assume now that the silver cube above was melted and reshaped into a sphere. Find the sphere’s diameter.

8C. Gold has a density of 19.3 g/cm3 and can be rolled into very thin sheets. If a 285 mg sample of gold is rolled into a “circle” of radius 0.78 cm, find the thickness of the “circle,” in microns.

9. In industrial quality control, a Vernier caliper can be used to measure dimensions of machined objects to a very high degree of precision. Suppose the actual diameter of a bolt is known to be 1.723 cm. For each of the following, give three examples of measured data of this diameter that are:

A. imprecise and inaccurate

B. precise and inaccurate

C. precise and accurate

ANSWERS: 8A. s = 2.70 cm 8B. d = 3.35 cm 8C. 77 microns