

Chemistry 121-Worksheet 2

Dimensional Analysis Problems**Please show dimensional analysis setup for problems 1-5.**

1. A dose of medication is 35.0 microliters. Express this volume in liters.

$$0.000035 \text{ L} \quad 3.50 \times 10^{-5} \text{ L}$$

2. The mass of a sample is 550.0 milligrams. What is the mass in kilograms?

$$0.00055 \text{ kg} \quad 5.500 \times 10^{-4} \text{ kg}$$

3. Miles per hour is the common unit for speed in the US. In most other countries, the unit for speed is in kilometers per hour. The autobahn's speed limit is 130 km/hr.

- a. What additional piece of information would I need to convert kilometers per hour into miles per hour.

miles to kilometers

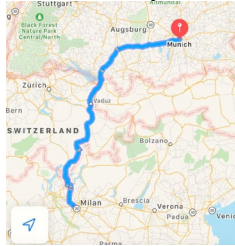
- b. Find that information on the internet (you can use your computer or phone)

$$1 \text{ km} = 0.621371 \text{ miles}$$

- c. Setup dimensional analysis and find the speed in miles per hour.

$$130 \text{ km/hr} \times (0.621 \text{ miles} / 1 \text{ km}) = 80.7783 \text{ mph}$$

- d. At this speed how many minutes will it take to go from Munich in Germany to Milan in Italy?



$$496.9 \text{ km} / 130 \text{ km/hr} = 3.8 \text{ hrs}$$

4. Convert 68.3 cm^3 to m^3

$$6.83 \times 10^{-5} \text{ m}^3$$

5. What is the mass in *kilograms* of a gold nugget that is 100.0 cm^3 of gold?

$$\text{Gold density} = 19.3 \text{ g/cm}^3$$

$$100.0 \text{ cm}^3 \times 19.3 \text{ g/cm}^3 \times 1\text{kg}/1000\text{g} = 1.93 \text{ kg}$$