

Chemistry 101
Solutions to Quiz # 1
Monday, September 8 version

1. (3 pts) Complete the following conversions:

(a) 350.0 ml into L

$$\frac{350.0 \text{ mL}}{1000 \text{ mL}} \times \frac{1 \text{ L}}{1} = 0.3500 \text{ L}$$

Note that the zeros at the end of a decimal number are significant, so they are retained in the final answer.

(b) 152 lbs into kg

$$\frac{152 \text{ lbs}}{2.20 \text{ lb}} \times \frac{1 \text{ kg}}{1} = 69.1 \text{ kg}$$

(c) 0.050 mg into μg

$$\frac{0.050 \text{ mg}}{1 \text{ mg}} \times \frac{1000 \mu\text{g}}{1} = 50. \mu\text{g}$$

note that the zeros at the end of a decimal number are significant, so we have placed a "." after 50 to indicate it is significant and the answer has 2 s.f.

2. (3 pts) For each measurement below, indicate the number of significant digits:

(a) 310.05 mg

5, all non-zero digits are significant, zeroes between non-zero digits are significant.

(b) 0.025 L

2, all non-zero digits are significant, zeroes at the beginning of a decimal number are not significant.

(c) 1.30×10^5 dL

3, all the digits in the coefficient of a number in scientific notation are significant.

3. (2 pts) Give the answers to the following problems, rounding to the correct number of significant figures:

(a) $0.752 \times 4.2 \times 6.0 = 19$

multiplication - round to smallest # s.f. in problem - in this case two.

(b) $1.43 + 10.52 + 10.808 = 22.76$

addition - round to the smallest number of decimal places in the problem - in this case two.

4. (2 pts) A dialysis unit requires 75,000 mL of distilled water. How many gallons of water are needed?

$$\frac{75,000 \text{ mL}}{946 \text{ mL}} \times \frac{1 \text{ qt}}{1} \times \frac{1 \text{ gallon}}{4 \text{ qt}} = 20. \text{ gallons}$$

Possibly Helpful Conversions

1 kg = 2.20 lb

454 g = 1 lb

1 ton = 907.2 kg

946 mL = 1 qt

0.946 L = 1 qt

1 L = 1.06 qt

1 gallon = 4 qts

1 mg = 1000 μg