Review

(#5-?)

1. Where does your accuracy end in the following examples Draw a rounding line.

5|000 gallons and 5,000.0| gallons

5.0| meters and 5.0 meter sticks ← exact value No line

Complete the following problems using correct significant figures. Please indicate the number of significant digits for each problem. (#5-3)

2. 25.0 + 0.05 = 25.05 → 25.1

3. 1.0E3 + 155. = 1000. + 155 = 1155. → 1100

4. 1234.0 - 22.000 = 1234.0 − 22000. = −20766. → −20000. or 2.0E−4

5. 250.0 * .0005 = 0.125 ← 0.1

6. 0.1000 * 2 = 0.2000

7. 3.5000 E9 * 0.100 = 3.50 E8

8. 2500000. / 2500000.0 = 1.0

Conversions(#5-1)

9. Convert 524.0 cm to km. cm → Km

$$524\,cm \cdot \frac{1\ km}{100{,}000\ cm} = 0.00524\ km$$

10. How many feet are in 105. meters? m → cm → in → ft

$$105\,m \cdot \frac{100\ cm}{1\ m} \cdot \frac{1\ in}{2.54\ cm} \cdot \frac{1\ ft}{12\ in} = 344.\ ft$$

Chemical conversions (#5-1)

11. How much does 1 mole of CO_2 to weigh?

$12 + 16(2) = 44\ g/mol$

12. If you had 40.0 grams of CO_2, do you have more or less then one mole?

less

13. How many actual molecules are in the 40.0g sample of CO_2.

$$40\,g \cdot \frac{1\ mol}{44\ g} \cdot \frac{6.022E23\ molecules}{1\ mol} = 5.47\,E23$$

14. Does a 36.36g sample of Ca have more, less or equal number of particles than the 40.0g of CO_2? ← 40 g/mol

$$36.36g \cdot \frac{1\ mol}{40\ g} = 0.9 \quad \text{equal} \quad 40\,g \cdot \frac{1\ mol}{44\ g} = 0.9$$

15. A 3.0E23 atoms of carbon has what mass?

$$3.0E23 \cdot \frac{1\ mol}{6.022E23\ atoms} \cdot \frac{12g\,C}{1\ mol} = 5.97g\ (6.0g)\ \text{S.S fig}$$

16. Coconut oil is made up of many different oils but the oil in the largest quantity is lauric acid. Lauric acid has a molar mass of 200.0 g/mol. If you have 20.0g of lauric acid on your spoon, how many molecules are present?

$$20.0g \cdot \frac{1\ mol}{200\ g} \cdot \frac{6.022E23}{1\ mol} = 6.022\,E22\ molecules$$