

Chemistry 12

Some Review of Chem 11 - Mole Stuff

Part 1 - Changing Moles to Grams and Grams to Moles

The two conversion factors to remember are:

$$\frac{\text{MM grams}}{1 \text{ mole}} \quad \& \quad \frac{1 \text{ mole}}{\text{MM grams}}$$

Where MM stands for the Molar Mass

The Molar Mass is calculated by adding up atomic masses from underneath the symbol and the name on the periodic table.

eg. The molar mass of Na_2SO_4 is calculated as follows:

$$2(23.0) + 32.1 + 4(16.0) = 142.1 \text{ grams/mole}$$

Here are some examples of converting using the conversion factors:

1. 2.60 moles of Na_2SO_4 = _____ grams

$$2.60 \text{ moles} \times \frac{142.1 \text{ grams}}{1 \text{ mole}} = 369.46 \text{ grams}$$

NOTE: In Chemistry 12 calculations, we must consider significant digits. The 2.60 has 3 SD's and the 142.1 has 4 SD's. When multiplying, the answer must be rounded off to the least # of SD's in the numbers being multiplied. So this answer must be rounded to 3 SD's.

So the answer is 369 grams

ANOTHER NOTE: If a calculation is just one step in a series of calculations, DON'T round off the answer. If possible, leave it in your calculator the way it is and go from there.



2. 1053.24 grams of K_2Se = _____ moles

Solution:

The molar mass of K_2Se is $2(39.1) + 79.0 = 157.2$ g/mole

$$1053.24 \text{ grams of } K_2Se \times \frac{1 \text{ mole}}{157.2 \text{ grams}} = 6.700 \text{ moles}$$

NOTE: The reason for the two 0's on the end of 6.700 is because the lowest # of SD's in the numbers divided is 4SD's (The 157.2) so the answer must have 4 SD's

Now some for you to do

Work each of the following out showing the work and the units in the work and in the answer! These will be marked and counted as homework marks.
(2 marks each)

1. 833.4 grams of H_2O = _____ moles

Answer _____

2. 2.3×10^{-3} moles of H_2SO_4 = _____ grams

Answer _____

3. 3.84 grams of $(NH_4)_2CO_3$ = _____ moles

Answer _____



7. 0.1962 grams of Zn/second = _____ moles of Zn/second

Answer _____

8. 0.014 moles of CO₂/s = _____ grams of CO₂/s

Answer _____

9. 3.718 grams of CO₂/s = _____ moles of CO₂/s

Answer _____

10. 1.12 L of CO₂/s = _____ moles of CO₂/s (at Standard Temp. and Pressure)

HINT: Recall that for gases at STP there are 22.4 L/ 1 mole so conversion factors could be:

$$\frac{22.4 L}{1 \text{ mole}} \quad \text{or} \quad \frac{1 \text{ mole}}{22.4 L}$$

Answer _____