compound

Moles Worksheet

1) Define "mole".

6.02×10^{23} atoms

2) How many moles are present in 34 grams of $Cu(OH)_2$?

$$34\text{g} \times \frac{1\text{ mol}}{97.56\text{g}} = 0.35\text{ mol}$$

3) How many moles are present in 2.45×10^{23} molecules of CH_4?

$$2.45 \times 10^{23}\text{ molecules} \times \frac{1\text{ mol}}{6.02 \times 10^{23}\text{ molecule}} = 0.407\text{ mol}$$

4) How many grams are there in 3.4×10^{24} molecules of NH_3?

$$3.4 \times 10^{24}\text{ molecules} \times \frac{1\text{ mol}}{6.02 \times 10^{23}\text{ molecules}} \times \frac{17.03\text{g}}{1\text{ mol}} = 96\text{ g } NH_3$$

5) How much does 4.2 moles of $Ca(NO_3)_2$ weigh?

$$4.2\text{ mol} \times \frac{164.07\text{g}}{1\text{ mol}} = 680\text{ g}$$

6) What is the molar mass of MgO?

$24.30 + 16.00 = 40.3\text{ g}$

7) How are the terms "molar mass" and "atomic mass" different from one another?

atomic: The total mass of protons neutrons electrons in a single element

molecular: The total weight of a compound

8) Which is a better unit for expressing molar mass, "amu" or "grams/mole"?

grams / mole

elements
Paul Criscuolo
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Mole Calculation Worksheet

1) How many moles are in 15 grams of lithium?

$15\,g \times \frac{1\ mol}{6.94\,g\,Li} = 2.1\ g\ mol\ Li$

2) How many grams are in 2.4 moles of sulfur?

$2.4\ mols \times \frac{32.06\,g\,S}{1\ mol} = 77\,g\,S$

3) How many moles are in 22 grams of argon?

$22g\ Ar \times \frac{1\ mol}{39.94\,g\,Ar} = 0.55\ mol\ Ar$

4) How many grams are in 88.1 moles of magnesium?

$88.1\ g\ mol \times \frac{24.30\ Mg}{1\ mol} = 214\,g\,Mg$

5) How many moles are in 2.3 grams of phosphorus?

$2.3\,g \times \frac{1\ mol}{30.97\,g\,P} = 0.074\ mol\ P$

6) How many grams are in 11.9 moles of chromium?

$11.9\ mol \times \frac{51.99\,Cr}{1\ mol} = 619\,g\,Cr$

7) How many moles are in 9.8 grams of calcium?

$9.8\,g \times \frac{1\ mol}{40.07\,g} = 0.24\ mol\ Ca$

8) How many grams are in 238 moles of arsenic?

$238\ mol \times \frac{74.92\,g}{1\ mol} = 17800\,g\,As$

What are the molecular weights of the following compounds?

9) NaOH

1 Na = 22.98
1 O = 16.00
1 H = 1.01
= 39.99 g

10) H_2O

2 H = 2.02
1 O = 16.00
= 18.02 g

11) $MgCl_2$

1 Mg = 24.30
2 Cl = 70.9
= 95.2

12) H_3PO_4

3 H = 3.03
1 P = 30.97
4 O = 64.00
= 98 g

13) Mn_2Se_7

2 Mn = 109.86
7 Se = 552.72
= 662.589 g

14) $(NH_4)_2SO_4$

2 N = 14.00
8 H = 8.08
1 S = 32.00
4 O = 64.00
= 118.14 g

