Warm Up

How many moles are in 2.14×10^{24} molecules of NO_2?

$$2.14 \times 10^{24} \text{ molecules } NO_2 \times \frac{1 \text{ mol } NO_2}{6.02 \times 10^{23} \text{ molecules } NO_2} =$$

$$\boxed{3.55 \text{ mol } NO_2}$$

How many atoms are in 6.08 moles of C_4H_8?

$$6.08 \text{ mol } C_4H_8 \times \frac{6.02 \times 10^{23} \text{ molecules } C_4H_8}{1 \text{ mol } C_4H_8} \times \frac{12 \text{ atoms}}{1 \text{ molecules } C_4H_8}$$

$$= \boxed{4.39 \times 10^{25} \text{ atoms}}$$

#3-6 p. 291-292

(3) 4.65 mol Si

(4) 0.360 mol Br_2

(5) 2.75×10^{24} atoms

(6) 7.72 mol NO_2

$$2.17 \times 10^{23} \text{ molecules } Br_2 \times \frac{1 \text{ mol } Br_2}{6.02 \times 10^{23} \text{ molecules } Br_2} = \boxed{0.360 \text{ mol } Br_2}$$

$$1.14 \text{ mol } SO_3 \times \frac{6.02 \times 10^{23} \text{ molecules } SO_3}{1 \text{ mol } SO_3} \times \frac{4 \text{ atoms}}{1 \text{ molecules } SO_3} = \boxed{2.75 \times 10^{24} \text{ atoms}}$$

Determine the number of moles found in 7.44×10^{26} atoms of iron?

Determine the number of atoms found in 9.08 moles of carbon dioxide?

Molar Mass

- the molar mass of a substance represents the mass of one mole of the substance
  - it is expressed in grams per mol (g/mol)

To determine the molar mass of a substance:

- make sure the formula is written properly
- determine the number of atoms of each element
- use the atomic molar masses of each atom from the periodic table and multiply this by the number of atoms
- add the mass of the atoms together so as to represent the total mass of the substance in grams per mole

Ex. What is the molar mass of $(NH_4)_3PO_4$?

N → 3 x 14.01 = 42.03
H → 12 x 1.01 = 12.12
P → 1 x 30.97 = 30.97
O → 4 x 16.00 = 64.00

149.12 g/mol

Find the molar mass of:

a) H_2O $(2 \times 1.01) + (1 \times 16.00) = 18.02\ g/mol$

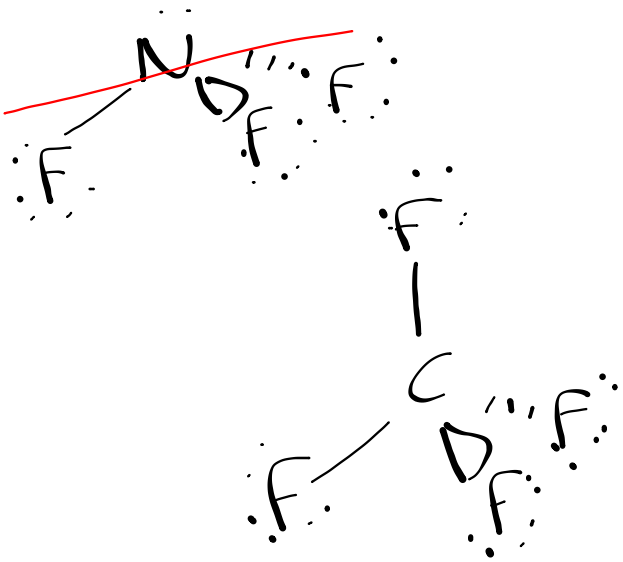
b) $Ca(NO_3)_2$ $(1 \times 40.08) + (2 \times 14.01) + (6 \times 16.00)$
$= 164.10\ g/mol$

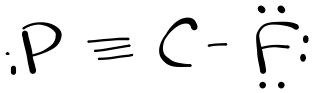
c) $C_6H_{12}O_6$

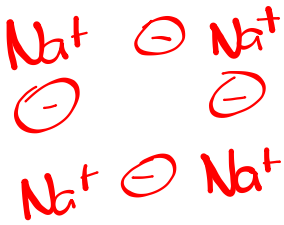
Homework

p. 296 #13-15

NF_3







$C_1 = C_2 - C_3$

sp ⟹ σ bond w/ C_1

sp ⟹ σ bond w/ C_3

p_y, p_z } π bonds w/ C_1