Class Announcements

i Clicker for credit starts today.

Grading : Participate in 75% of the class discussion
questions ... ie submit an approbiate
answer.

Allowed 3 absences for the semester.

What is the mass in grams of 1 mole of Li.

^6Li:	6.015 amu	7.42%
^7Li:	7.016 amu	92.58%

$N = 6.0221 \times 10^{23} \ mol^{-1}$ $1 \ amu = 1.6606 \times 10^{-24} g$

1 atom: $0.0742 \ (6.015) + 0.9258 \ (7.016) \ = \ \boxed{6.9417 \ amu}$

$$6.9417 \ \text{amu} \ \frac{1.6606 \times 10^{-24} \ g}{1 \ \text{amu}} \ = \ 1.1527 \times 10^{-23} \ g$$

$-!$

1 atom of Li : $1.1527 \times 10^{-23} \ g$

1 mol of Li : $1.1527 \times 10^{-23} \ g \ (6.0221 \times 10^{23} \ mol^{-1})$

$= \ \boxed{6.9417 \ g. \ mol^{-1}}$

Al	Si	P	S
13	14	15	16
26.98	28.09	30.97	32.07

Al: 26.98 g.mol^{-1}

↳ P: 30.97 g.mol^{-1}

C_4H_{10} :   4(c) + 10(H)

4(12.01) + 10(1.01) = 58.14 g.mol^{-1}

Molar Mass

Reminder : 58.14 g.mol^{-1} = $\dfrac{58.14\,g}{1\,mol}$

Example 1

a) How many ATOMS of fluorine are present in 3.30 moles of BF_3?

b) How many MOLES of fluorine are present in 3.09×10^{22} molecules of BF_3

$$N = 6.023 \times 10^{23}$$

a) $\dfrac{3.30 \text{ mol } BF_3}{} \bigg| \dfrac{3 \text{ F}}{1 \text{ } BF_3} = 9.90 \text{ mol F}$

$\dfrac{9.90 \text{ mol F}}{} \bigg| \dfrac{6.023 \times 10^{23} \text{ atoms}}{1 \text{ mol}} = 5.96 \times 10^{24} \text{ atoms F}$

b) $\dfrac{3.09 \times 10^{22} \text{ molecules } BF_3}{} \bigg| \dfrac{1 \text{ mol}}{6.023 \times 10^{23} \text{ molecules}} = 0.0513 \text{ mol } BF_3$

$\dfrac{0.0513 \text{ mol } BF_3}{} \bigg| \dfrac{3 \text{ F}}{1 \text{ } BF_3} = 0.154 \text{ mol F}$
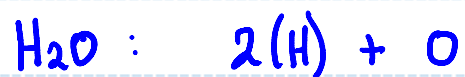
Slide - 4

How many **MOLES** of water are present in 5.41 grams of this compound ?

$O: 16.0 \qquad H: 1.01$

a) 0.1   b) 0.2   c) 0.3   d) 0.4   e) Help

5.41 g water $\longrightarrow$? mol water

H_2O : 2(H) + O

2(1.01) + 16.0 = 18.02 g·mol^{-1} .... $\dfrac{18.02\ g}{1\ mol}$

$5.41\ g\ water\ \dfrac{1\ mol}{18.02\ g} = 0.3\ mol\ water$

How many Grams of ethanol (CH_3CH_2OH) are present in 0.61 moles of this compound ?

a) 46
b) 96
c) 28
d) Help

C: 12.01
H: 1.01
O: 16.00

CH_3CH_2OH : $2(C) + 6(H) + O$

$2(12.01) + 6(1.01) + 16.00 = 46.08 \ g.mol^{-1}$

$$\frac{46.08 \ g}{1 \ mol}$$

$$0.61 \ mol \ CH_3CH_2OH \ \left| \ \frac{46.08 \ g}{1 \ mol} \right. = 28.1 \ g \ CH_3CH_2OH$$

Balance the following chemical equation:

$$2\ Fe_2O_3(s) + 3\ C(s) \quad = \quad \overset{4}{\cancel{2}}\ Fe(s) + 3\ CO_2(g)$$
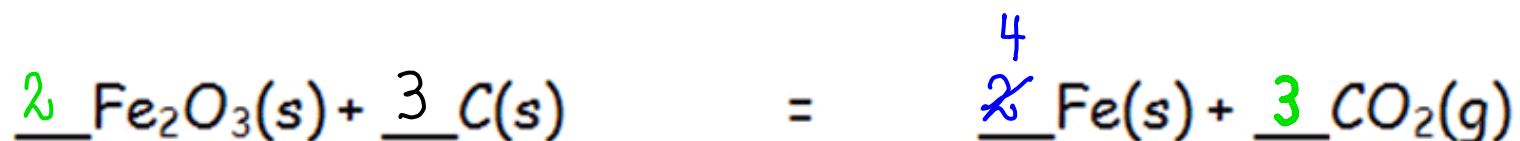
Reactants					✓
Fe	2	2	4	4	4
O	3	3	6	6	6
C	1	1	1	1	3

Products					✓
Fe	1	2	2	4	4
O	2	2	6	6	6
C	1	1	3	3	3

$$2\ Fe_2O_3(s) + 3\ C(s) = 4\ Fe(s) + 3\ CO_2(g)$$