February 10, 2015

-Covalent formulas/names
-Chemical Reactions/Equations
-Stoichiometry

Recall –
  Molecular (binary) compounds (covalent)
  e.g. H_2 or H_2O both atoms non-metals

How would you name CO_2? carbon dioxide
  "　"　"　" CO? carbon monoxide
Many molecular compounds have more
  than one combining ratio. e.g. SO_2 + SO_3
  e.g. SO_2 – no balance of charges.

       sulfur dioxide
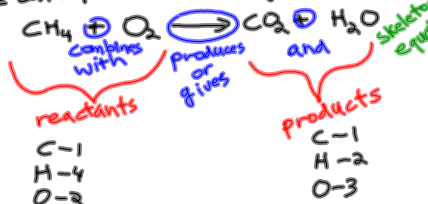 e.g. SO_3 – sulfur trioxide
  e.g. N_2O_5 – dinitrogen pentoxide
  e.g. $SiCl_4$ – (mono) silicon tetra chloride
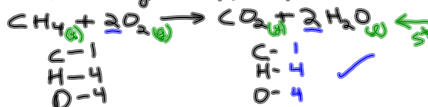   Questions p.24 #9-11

  Chemical Reactions

Methane ^{CH_4} combines with oxygen gas ^{O_2}
to make carbon dioxide and water.
             ^{CO_2} ^{H_2O}

In a chemical reaction, atoms rearrange.
We can represent this using an equation.

$CH_4 \oplus O_2 \Longrightarrow CO_2 \oplus H_2O$　Skeleton equation
    combines   produces   and
    with   or
                  gives
      reactants   products

      C – 1   C – 1
      H – 4   H – 2
      O – 2   O – 3

Balance using coefficients
  $CH_{4(g)} + 2O_{2(g)} \longrightarrow CO_{2(g)} + 2H_2O_{(g)}$
      C – 1   C – 1
      H – 4   H – 4 ✓
      O – 4   O – 4

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  Atomic and Molecular Mass

Mass of an   Mass of a molecule
atom in   in a.m.u.
a.m.u.

  Average (of all isotopes) mass of an atom

  e.g. H_2O 2–H $2 \times 1.01 = 2.02$ mole
                 1–O $1 \times 16.00 = 16.00$
                       ――――――――
                         18.02 a.m.u.

  Mole – A certain number of things.
         6.02×10^{23}

* A mole of particles has the same
  mass number as atomic mass but the
  units are grams.
     e.g. H_2O – 18.02 μ ← amu
     A mole of H_2O – 18.02 g $\left(6.02 \times 10^{23}\right)$ Rec
                  molec.   molec.   p.

   The molar mass of
      H – 1.01 g
      O – 16.00 g
      H_2O – 18.02 g

   Express   moles ⟷ grams

  e.g. Find molar mass of $CaCO_3$.
       Ca – 40.08 g
       C – 12.01 g
     3–O – $3 \times 16.00 = 48.00$ g
           ――――――――――
             100.09 g (1-mole)

  e.g. What is the mass of 3.5 moles $CaCO_3$
     3.5 mol $CaCO_3$ × $\dfrac{100.09 \text{ g } CaCO_3}{}$ = 350

Feb 10-6:03 PM