

Unit 6: Ch 11 – Empirical Formulas & Hydrates

PART 1 - EMPIRICAL FORMULAS (E.F.):

➤ DEFINITION →

MOLECULAR FORMULAS (M.F.):

➤ DEFINITION →

- M.F. can be the _____ as the E.F.

<i>MOLECULAR Formula (MF)</i>	<i>EMPIRICAL Formula (EF)</i>

CALCULATING EMPIRICAL FORMULAS (EF):

- ** Step #1: _____ given _____, convert to _____ (*assume out of _____*).

- Ex: Write the E.F. of a compound that contains: 43.6 % P and 56.4 % O.

- P = _____ = _____ O = _____ = _____

- Step #2: Calculate the _____ of _____ atom from grams.

- PROCESS: _____

- Ex: Write the E.F. of a compound that contains: 43.6 % P and 56.4 % O.

- P = _____ O = _____

- Step #3: *Divide* _____ mole by the _____ mole.

- This produces a _____ whole number ratio.

- Ex: Write the E.F. of a compound that contains: 43.6 % P and 56.4 % O.

- P = _____ O = _____

➤ ** Step #4: **IF** all _____ are _____ whole numbers, _____ **ALL** ratios by the _____ common *factor* to give all whole numbers.

- May round **prior** to applying _____ within _____ of nearest _____ or _____.
- This produces a _____ whole number ratio.
- Ex: Write the E.F. of a compound that contains: 43.6 % P and 56.4 % O.

▪ P = _____ = _____ O = _____ = _____

➤ Step #5: **TRUE** whole number ratios become _____ in final **EMPIRICAL FORMULA (EF)**.

- Ex: Write the E.F. of a compound that contains: 43.6 % P and 56.4 % O.

▪ Empirical Formula (EF) = _____ Name: _____

PRACTICE: Ex #2) Write empirical formula (EF) of a compound that contains: 67.6 g Hg, 10.8 g S, and 21.6 g O.

PART 2 - HYDRATES:

➤ **DEFINITION** →

- **General Formula:** _____

▪ Ex: _____ → Name = _____

CALCULATING HYDRATES:

➤ Step #1: Calculate _____ between _____ **AND** _____ sample.

- Solves for the amount of _____.

- Step #2: Calculate _____ of the _____ sample **AND** amount of _____.
- Step #3: *Divide* by the _____ to get the _____.
- **NOTE:** _____ compound nomenclature can _____ have _____.
- ** Step #4: IF given _____ or _____ of the _____ **AND** _____, solve as a regular **EMPIRICAL FORMULA** problem.

HYDRATES PRACTICE:

Ex #1: A 344 gram sample of hydrated calcium sulfate is heated to vaporization. Once heated, the sample has a mass of 272 grams.

- What is the mole ratio between ionic compound AND water?
- What is the hydrate name AND formula?

Ex #2: What is the formula of a hydrate that is 433.5 g Mo_2S_5 and 66.5 g H_2O ?