CONCEPT: MOLECULAR FORMULA

- Recall, the molecular formula gives the _____ number of different elements in a given compound.

Compound	Empirical Formula	n-factor	Molecular Formula
Glucose	CH_2O		
Octane	C_4H_9		
Salicylic Acid	$C_7H_6O_3$		

Calculating the Molecular Formula

- Once the empirical formula is determined, the molecular formula can be obtained if the _____ is also known.

EXAMPLE: After a workout session, lactic acid ($\mathcal{M}$ = 90.08 g/mol) forms in muscle tissue and is responsible for muscle soreness. Elemental analysis shows that this compound contains 40% C, 6.7% H and 53.3% O. Determine the molecular formula.

STEP 1: Repeat the steps necessary to determine the empirical formula of the compound.

STEP 2: Calculate the _____ mass of the compound.

STEP 3: Divide the **molar mass** of the molecular formula by the **empirical mass** to determine the **n-factor**.

STEP 4: Multiply the _____ of the empirical formula by the **n-factor** to get the molecular formula.

CONCEPT: MOLECULAR FORMULA

PRACTICE: What is the molecular formula for the following compound?

Empirical Formula: $NPCl_2$ **Molar Mass:** 347.64 g/mol

PRACTICE: Cortisol ($\mathcal{M}$ = 362.47 g/mol), a known steroid hormone, is found to contain 69.6% carbon, 8.34% hydrogen, and 22.1% oxygen by mass. What is its molecular formula?

PRACTICE: Elemental analysis of a pure compound indicated that the compound had 72.2% C, 8.50% H and the remainder as O. If 0.250 moles of the compound weighs 41.55 g, what is the molecular formula of the compound?