

# Introduction to Chemical Quantities Test Study Guide

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**PART ONE of the test will consist of multiple choice, matching, true false questions.**

**PART TWO of the test will consist of calculation problems that require the work to be shown just like demonstrated in class.**

**You will be allowed to use a Periodic Table and a Polyatomic Ion List as your ONLY references.**

**You will be allowed to use your calculator.**

**You will be allowed ONE class period only to complete BOTH parts of the test.**

## **Objective Part 1 (35 to 45 questions)**

Be able to calculate % composition given any chemical formula

Be able to calculate a molecular formula given empirical data and a molecular mass

Be able to calculate an empirical formula given mass composition or percent composition data

Be able to calculate moles from grams and grams from moles

Be able to calculate the molar mass of any given chemical formula

Be able to calculate the number of atoms from the number of molecules

Be able to calculate the number of atoms from the number of moles

Be able to compare relative quantities of mass and moles

Be able to convert from grams to moles or from moles to grams

Be able to identify the correct or incorrect procedure in working a simple calculation

Know the definition and value of "standard molar volume"

Know the definition and values for "STP"

Know the definition of "gram atomic mass"

Know the definition of "gram formula mass"

Know the definition of "gram molecular mass"

Know the definition of "molar mass"

Know the units for molar mass, standard molar volume, gas density, solid – liquid density, mass and moles

Know the value of Avogadro's Number

Know, understand, and be able to apply *Avogadro's Principle*

STP = 273 Kelvin or zero degrees Celsius; and 1.00 atm or 760 mm Hg

Understand the difference between an empirical formula and a molecular formula

## **Written Problems Part 2 (4 to 6 problems)**

calculate an Empirical and Molecular formula problem

calculate the density of a known gas at STP

calculate the mass in grams of a given volume of known gas at STP

calculate the mass in grams when given a number of moles of a known substance

calculate the molar mass of a gas given its density at STP

calculate the number of molecules from a given amount of mass in grams

calculate the number of moles given an amount in grams of a known substance

calculate the volume of a known gas at STP given mass in grams