Name _____ Period _____

Chemistry of the Earth Lab 6 – The Mol in the Mass 40 Points

Lab Introduction

The mol is a unit that allows the conversion of the mass of individual particles, often given in grams (*g*), or atomic mass units (*amu*) to real measurable units (*mol*) based on Avogadro's Number (N_A), the number of particles in a mol ($6.022x10^{23} particles/mol$). The mass of one mol of particles is known as the molar mass (MM), and is given in the unit g/mol.

A compound or molecule's Molar Mass (MM) is calculated by adding the individual atom molar masses based on their atomic ratios together.

MM NaCl	Na	22.99g/mol	Cl	35.45g/mol	NaCl	58.44g/mol

When measuring a real sample to calculate mol of the substance, mass by difference is used:

Mass NaCl	Empty Weight Boat	4.00g	Full Weigh Boat	25.00g	Mass NaCl	25.00g - 4.00g = 21.00g

Procedure

1. Weigh the empty weighing boat, record on data table.
2. For each substance, measure the mass of the weighing boat with the solid, record on data table.

Data

Data table for mass measured for samples A – D at lab stations

Mass Empty Weighing Boat		Mass of Boat + $NaHCO_3$ (A)		Mass of Boat + NaCl (B)	
		Mass of Boat + $CuSO_4$ (C)		Mass of Boat + $CaCO_3$ (D)	

Molar Mass of Substances A – D

Sodium Bicarbonate ($NaHCO_3$)		
Element	#	Molar Mass
Sodium (Na)		
Hydrogen (H)		
Carbon (C)		
Oxygen (O)		
Sodium Bicarbonate ($NaHCO_3$)		

Sodium Chloride (NaCl)		
Element	#	Molar Mass
Sodium (Na)		
Chlorine (Cl)		
Sodium Chloride (NaCl)		

Copper(II) Sulfate ($CuSO_4$)		
Element	#	Molar Mass
Copper (Cu)		
Sulfur (S)		
Oxygen (O)		
Copper(II) Sulfate ($CuSO_4$)		

Calcium Carbonate ($CaCO_3$)		
Element	#	Molar Mass
Calcium (Ca)		
Carbon (C)		
Oxygen (O)		
Calcium Carbonate ($CaCO_3$)		

Calculations

Mass Compound = (Mass Boat + Compound) – Mass Boat

Mass $NaHCO_3$	
Convert mass $NaHCO_3$ to mol $NaHCO_3$	
Mol $NaHCO_3$	

Mass NaCl	
Convert mass NaCl to mol NaCl	
Mol NaCl	

Mass $CuSO_4$	
Convert mass $CuSO_4$ to mol $CuSO_4$	
Mol $CuSO_4$	

Mass $CaCO_3$	
Convert mass $CaCO_3$ to mol $CaCO_3$	
Mol $CaCO_3$	