

CHEQ 1094: THE MOLE CONCEPT

Date: _____ Name: _____ Lab Day/Time: _____

Objective

The objectives of this experiment is to be able to:

1. Understand the mole concept.
2. Understand the relationships between moles, grams, molecules, and atoms.
3. Determine the ratio of zinc atoms to iron atoms in a piece of galvanized iron.
4. Determine the mole relationship between substances in a chemical reaction.

Procedure

As in Chemistry 1094 lab manual page _____

Data and Observations

Part I

Table 1. Mass and Volume of substances

	Mass of substance and container	Mass of container only	Therefore mass of substance	Volume of substance
H ₂ O				
Hg				
Fe				
Sugar				
Salt				
O ₂				
CO ₂				

Part II

Table 2. Ratio of Zinc to Iron Atoms in Galvanized Iron

Length of galvanized iron	
Width of galvanized iron	
Mass of galvanized iron	
Mass of iron core	
Mass of zinc coating (2 sides)	

Calculations

Part I

Table 3. The mole and its relationship to other units.

For Water and Mercury, calculate the density from the mass and volume. For the other substances, calculate the volume from the mass and given density. Show all calculations and answers in the table.

Substance	Units	Total number of atoms in 1 mole of substance	Mass of 1 mole of substance (g)	Volume of 1 mole of substance (mL)	Density at room conditions (g/cm ³)
Water, H ₂ O	Molecules				
Mercury, Hg	Atoms				
Iron, Fe	Atoms				7.86
Sugar, C ₁₂ H ₂₂ O ₁₁	Molecules				1.59
Table Salt, NaCl	Na ⁺ ions Cl ⁻ ions				2.16
O ₂	Molecules				0.00130
CO ₂	Molecules				0.00179

Part II Table 4. (Show all calculations in the table!)

Mass of zinc coating (2 sides)	
Moles of zinc in coating (2 sides) <i>atomic mass of zinc = 65.38 g/mol</i>	
Moles of iron <i>atomic mass of iron = 55.847 g/mol</i>	
Mole ratio of iron to zinc	
Atoms of zinc on 2 sides	
Atoms of iron	
Ratio of iron to zinc atoms	
Mass of zinc on one side	
Density of zinc	7.14 g/cm ³
Volume of zinc on one side	
Thickness of zinc coating (cm)	
Thickness of zinc coating (nm)	

Questions

Answer any assigned questions from the manual here.