

The Density of Solids and Liquids

Date: _____ Name: _____ Section: _____

OBJECT: To (1) become familiar with the various instruments used to weigh and measure objects, and (2) determine the densities of solid objects and an unknown liquid

PROCEDURE:

As in Chem. 1105 lab manual, pp. _____.

OBSERVATIONS:

DATA:

Density of Solids

Tray number: _____	Object 1	Object 2	Irregularly Shaped Object
Mass of object and boat using top loading balance			
Mass of empty boat using top loading balance			
Therefore mass of object using top loading balance			
Mass of object and boat using analytical balance			
Mass of empty boat using analytical balance			
Therefore mass of object using analytical balance			

DATA:

Irregularly Shaped Object (Rock)

Volume of Water in Cylinder Before Adding Rock	Volume of Water in Cylinder After Adding Rock	Displacement of Water	Therefore Volume of Rock

CALCULATIONS: Calculate density of the rock

Calculated density (from the top loading balance)	
Calculated density (from the analytical balance)	

DATA:

In the table below, record the dimensions of your regularly shaped objects. See the notes from the pre-lab talk to know which dimensions are required for your object. Note that for some objects you will need fewer than three dimensions to describe it completely. In any case, supply the name of the dimension you are reporting for your object and the proper units.

	Object 1	Object 2
Shape of Object		
Dimension 1 by ruler		
Dimension 1 by vernier caliper		
Dimension 2 by ruler		
Dimension 2 by vernier caliper		
Dimension 3 by ruler		
Dimension 3 by vernier caliper		

CALCULATIONS:

BELOW THE TABLE, SHOW ALL YOUR CALCULATIONS FOR THE VOLUME AND DENSITY OF YOUR OBJECTS.

	Object 1	Object 2
Calculated Volume (from the ruler)		
Calculated Volume (from the vernier caliper)		
Calculated density (from the ruler and top loading balance)		
Calculated density (from the ruler and analytical balance)		
Calculated density (from the vernier caliper and top loading balance)		
Calculated density (from the vernier caliper and analytical balance)		

DATA:Density of liquids

Mass of 50 mL Erlenmeyer flask and stopper (g)	
Mass of flask, stopper, and first 15 mL aliquot (g)	
Mass of flask, stopper, first and second 15 mL aliquots (g)	

CALCULATIONS:

Mass of <i>each</i> <u>15 mL aliquot</u> of liquid emptied into flask (g)		
Density of each aliquot		
Average density of the unknown liquid		

In the space below, show your calculation for the density of the liquid.

RESULTS:

Using the density obtained with the most precise instruments, determine the identity of your metal objects *only* by comparing your density with the literature value found in a textbook or other handbook. The possible metals are: aluminum, copper, brass, iron, or steel.

Tray number: _____	Object 1	Object 2
Shape of object		
Calculated density from the most precise instruments		
Proposed identity		
Literature density		

Calculated density of rock from the most precise instruments	
Calculated density of liquid	

CONCLUSION:

QUESTIONS: