Density of Solids Lab

Name_____Date_____Group_____Period___

Objectives:

1- To determine the mass and volumes of several solids and use this information to calculate their densities.

2- Use the density information to identify which substance it is, from a list of known solids and their densities.

3- Gain practice in measuring mass with a balance, and in calculating volumes of solids by various methods.

Materials: Triple beam Balance,Plastic 50 ml Graduated cylinder, water,ruler, two small solids of different mass, metal slab, metal cylinder, hand lens

Safety: General

Procedures:

1–Determine the volumes of the three rectangular solids using the same technique as in the volume lab.

2-Measure the lengths of each of the three sides that meet at any corner of the rectangular solid as you did in the volume lab.

a- Use the hand lens to make a more precise measurement of the lengths.

b- Then record these measurements to the nearest 0.01 cm. in the chart and calculate their volumes using the formula: V = L x W x H

3- Next carefully mass the objects to the nearest 0.01 g. Then, by using the formula, **density = mass ÷ volume**, calculate the density in grams / cm^3.

4–Finally, determine the mass and then the volume of a metal cylinder and then calculate its density from this data. **However**, to determine the volume of the metal cylinder, you will have to use the water displacement method, which you have also done previously in the volume lab. Dry off the cylinder before placing it back into the plastic bag!

Observations

Record your measurements below for the **rectangular** shaped solids!

V = L x W x H D = M ÷ V

Object	Length of Side 1 to 0.01 cm	Length of Side 2 to 0.01 cm	Length of Side 3 to 0.01 cm	Volume in cm^3 to 0.01 cm^3	Mass in grams to 0.01g	Density in g/cm^3 (round to nearest .1 g/cm^3)
Small light solid						
Small Heavy solid						
Metal Slab						

Record your measurements below for the **metal cylinder only**!

D = M ÷ V

Volume of water to 0.1 cm^3	Volume of water and metal cylinder to 0.1 cm^3	Volume of just the metal cylinder to 0.1 cm^3	Mass of metal cylinder to 0.01g	Density in g/cm^3 to 0.1 g/cm^3

Class Results

Group	Density of small light solid	Density of small heavy solid	Density of metal slab	Density of metal cylinder	Group	Density of small light solid	Density of small heavy solid	Density of metal slab	Density of metal cylinder
1					10				
2					11				
3					12				
4					13				
5					14				
6					15				
7									
8					Range Low-high				
9					Mean				

Question 1: Suppose someone in the class, had determined the volume of the metal cylinder by using the water displacement method, and then they measured it's mass without wiping dry the cylinder first. Explain what effect this would have on the density they calculate, compared with the actual density of the cylinder ? (Complete sentence)

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Substance W density is 2.7 g/cm^3	**Substance X density is 4.9 g/cm^3**	**Substance Y density is 7.9 g/cm^3**
	Substance Z density is 9.0 g/cm^3	

Question 2. Identify what substance from the list above that each of the four objects is most likely to be**.**

small light solid : _____ **metal slab:**_____

small heavy solid:_____ **metal cylinder:**_____

Sources of Error : Identify ***two*** things that people may have done incorrectly that would have caused them to get totally different answers from the rest of the class. These errors must be unique,in other words they have not been applicable in previous labs. They must be ***new*** sources of error. Be ***specific*** about what might have been done.

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