Physics 207-GH1
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Title: Lab 7- Buoyancy Lab

Introduction

In this lab we tested buoyancy and the effect of liquid surface affects mass & density on an object. Calculating the density of a metal object in water did this. The density of a wooden block & metal object in water was found. Then density of unknown liquid & metal was found. All these experiments will help us understand buoyancy.

Data and Calculation

Experiment 1: Method 1

Mass of object (metal)= 49.7g

Mass of object with water (metal)= 43g

Mass of Change= 6.7g

Density of water= 1g/cm^3

Density of object (metal)= (m/m-M) * Density of liquid
=49.7g/(49.7g-43g)* (1g/cm^3)
=7.418 g/cm^3

Volume of object (metal)= 7.418 g/cm^3/49.7g
= 0.15 g/cm^3

Density of object (metal): density approaches

- Zinc (7.2)
- Iron (7.1)

Force of Buoyance= (1000 kg/m^3)(9.8 m/s^2)(0.497 kg)/(7418 kg/m^3))
= 0.657 N

Experiment 1: Method 2

Mass of object (without beaker)= 239.1g

Mass of object (with beaker)= 245.8g

Mass of change =6.7g (mass doesn't change, So mass of the object (metal) not change of the experiment of the density of metal and force will remain the same).

Experiment 2

Mass of object (wood block)= 15.5g

Mass of object (in water)= 37.8g

Mass of object (wood)= 65.6g

Density of water= $1g/cm^3$

Density of object= $(1g/cm^3)*(65.6g)/(65.6-37.8)$

= 2.33

Volume of object = 2.33/65.6

= 0.035 cm^3

Volume of object (wood)= 0.035-0.015

= .02 cm^3

Density of Wood= 0.31 g/cm^3 (It close to Pine white oven dry)

Experiment 3:

Mass of object (metal)= 49.7g

Mass of object (unknown)= 45.5g

Mass of change= 4.2g

Density of object (unknown)= $(7.41\ g/cm^3)(4.2g)/49.7\ g$

= 0.626

Questions

1. **Experiment#1:** Method 1 & 2 same mass of change 6.7g.
2. Result of the metal of the hood is completely submerged. Therefore mass of the results force of buoyance and weight should be higher of the object sink.
3. Liquid is alcohol

Conclusion

The Lab taught us that there are different components that attribute to the dynamics of Buoyancy. What was observed was that mass of metal and mass of liquid could be used to find density and thus use the density to find the volume. Another observation we found out is that the density could be found to find the density of any unknown liquid. The main part is that the experiment showed different types of effects a liquid substance has on a floating object's mass and on the object's density.