Density lab report

The purpose of this experiment is find the density of two metals using their mass and volume. Introduction: The purpose of the experiment that was conducted was to measure and calculate the density of two different metals.

Density is an important characteristic of a material. The density of an object shows how much mass is contained in the unit volume. To calculate the density of metals the experimenters had to find out the mass and volume of each and then use the following formula: d= m/V.

M or mass is the amount of matter that an object contains and it can be measured using a balance. The V or volume of an object represents the space that an object occupies. Material: -Two types of metals -Balance – 80ml of water – 100ml graduated cylinder Procedure: -Obtain pieces of two different metals.

Determine their mass using a balance. Record your measurements. Determine their volume in the following way: Place 75-80 ml of water in a 100ml graduated cylinder. Read the volume V(in) with precision of 0. 5 ml. Place the piece of metal carefully in the water.

Read the new volume V(fin).

Calculate the volume of the metal V(m). (Vm = Vfin-Vin). Record your results. – Calculate the density of the two metals -Ask for density from the literature and calculate percentage error with the following formula.

Percentage error= ((Density from data – density from literature) Density of literature) * 100 Results: DATA | METAL 1| METAL 2| Mass of metal (m)| 160. 5g| 47. 6g| Volume of water (Vin)| 79 ml| 79ml| Volume of water and metal

(Vfin)| 98ml| 97ml| Volume of Metal| 19ml| 18ml| | Metal 1| Metal 2|

Literature Data| 8. 96| 2. 70| Calculations: D= m/V Metal 1 Density= 160.

5/19= 8.

45 Metal 2 Density= 47. /18= 2. 64 Percentage error= ((Density from data –

density from literature) Density of literature) * 100 Metal 1 percentage error

= ((8. 45-8. 96)8. 96)*100= 5.

69% Metal 2 Percentage error = ((2. 64-2. 70)2. 70)*100= 2. 22%

Conclusion: After experimenting, calculating, and searching the two metals

that were given were Copper with a density of 8. 96 and aluminum that has

a density of 2.

70. When measuring a physical quantity, scientists should perform more

than one measurement and take the average value to be more precise. The

average value is taken by scientists to decrease the percentage of error.

Measurements might not always be the same due to different factors, so by

taking the average scientist takes in account all of the measurements and

finds one value that satisfies them all. The volumes of the two metals that

were given were very similar, 19ml and 18ml for Copper and Aluminous

respectively. Their masses in the other had are very different, the copper

had a mass of 160.

5g and aluminous 47. 6g. Since their volumes are similar but their masses

are different this must mean that their densities differ. As shown above this

is true, Copper that has a higher mass has a higher density of 8. 6, and

Aluminum with the less mass has a density of 2. 7.

If the experimenters had another piece of the same material but a mass twice as big then the density would remain the same. Mass and volume are directly related so when one goes up the other increases as well, and since the formula is d= m/v if they both change the result will remain the same. When an object is heated it expands outwards therefore occupying more space. This means that the density will decrease because the mass will remain the same. So taking account the formula above if only Volume is increased and mass remains constant then the result which is density will decrease.

That is why hot air will rise when heated. Hot air has less density than cold air so the more dens air will fall down and the less dens will rise up and take its place. Ice floats because it is about 9% less dense than liquid water. In other words, ice takes up about 9% more space than water, so a liter of ice weighs less than a liter of water. The heavier water displaces the lighter ice, so ice floats to the top. The same things happen in balloons and airships that use helium gas, the gas has less weight than and less density than the air so it floats and goes up.