

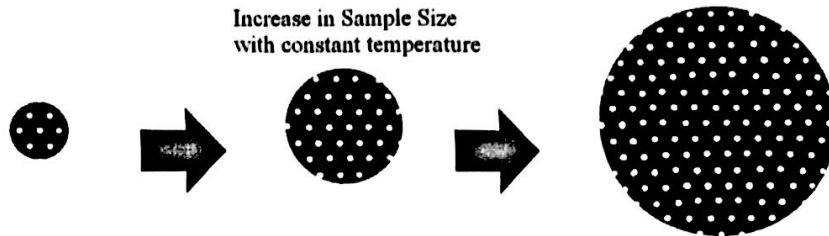
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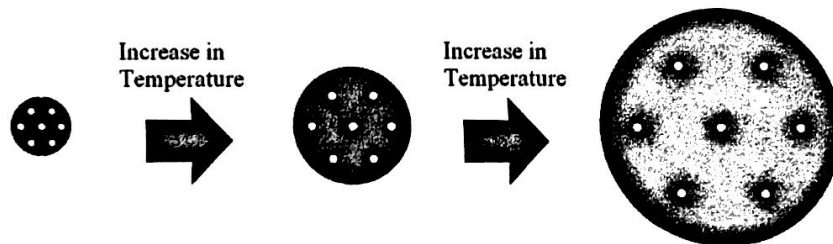
Density, Percent Error and Temperature Conversions

DENSITY

- ▶ Density is a measure of how close together particles are in a substance
- ▶ Density is an internal property that **DOES NOT CHANGE** with sample size.



- ▶ Density can be affected by a change in temperature because this changes the spacing between particles.
 - ▶ Increase in temperature – decrease in density
 - ▶ Increasing temperature causes molecules to spread apart.



The formula for density can be found on Table T in your Reference Tables. Write the formula for ~~percent error~~ below. Be sure to label the variables.

density

PERCENT ERROR

- ▶ **Percent error:** the percent that a measured value differs from the accepted value
- ▶ Used to show the difference between an accepted value and an experimental value at the end of a lab experiment

The formula for percent error can be found on Table T in your Reference Tables. Write the formula for percent error below:

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Density, Percent Error and Temperature Conversions

Questions:

1. A metal has a mass of 3.225 grams and a volume of 0.360 mL. What is the density of this metal? (Record your answer to the correct number of significant figures)
2. Based on the above density value, what precious metal is this according to Reference Table S? (Hint: precious metals are either platinum, gold, silver or copper)
3. Calculate the percent error comparing the measured value for density calculated in question 1 and compare it to the accepted value of density provided in Table S.
4. A graduated cylinder is filled with water to a level of 40.0 mL. When a piece of copper is lowered into the cylinder, the water level rises to 63.4 mL.
 - a) What is the volume of the copper sample?
 - b) If the density of the copper is 8.96 g/cm^3 , what is its mass?
5. What is the volume of a pure silver coin that has a mass of 14.0g? (Record your answer to the correct number of significant figures)
6. Different kinds of wood have different densities. The density of oak wood is generally 0.70 g/ml. If a 35.0 ml piece of wood has a mass of 25.0 g, is the wood likely to be oak?

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Density, Percent Error and Temperature Conversions

7. A student measures the density of water to be 0.97 g/mL. The actual value is 1.00 g/mL. Calculate the student's percent error. (Record your answer to the correct number of significant figures)

8. The student obtains a specific heat value of 4.86. Knowing the accepted value for the specific heat of water is 4.18 calculate the student's percent error.

9. The freezing point of water is 273.2 K, but it was measured at 250.1 K. What is the percentage error?

10. Convert the following temperatures using the formula from reference Table T.
 - a) 273 K = _____ °C
 - b) 373 K = _____ °C
 - c) 298 K = _____ °C
 - d) 0 K = _____ °C
 - e) 75°C = _____ K
 - f) -68°C = _____ K
 - g) 5°C = _____ K
 - h) 123°C = _____ K