

Chemistry Bell Work, April 9 – April 12

Mass and Volume 4:

Density Calculations, Graphical Solutions for
Density, Density Particle Model, Negligible,
Significant and Insignificant y-intercept.

Particles In Motion:

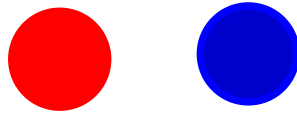
States of Matter, Phase Change



Chemistry Bell Work, Monday, Apr 9, 2018, 2 questions

1. List some important properties of the particle model that help explain the different densities of different substances.

a) matter is comprised of particles that have mass and take up space.



Mass is a measure of the number of particles present.



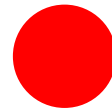
Volume is a measure of the space the particles take up.

b) The particles cannot be divided.

c) Some particles have more mass than others particles,

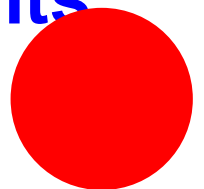
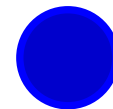


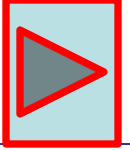
1 atomic mass unit



5 atomic mass units

d) and some particles take up more space.

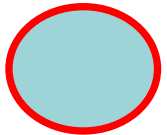




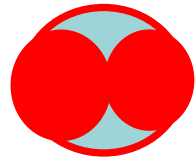
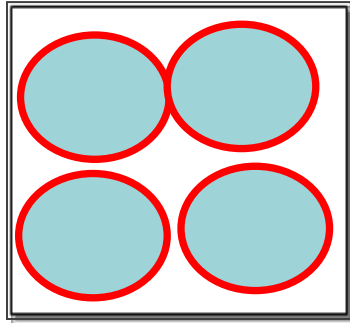
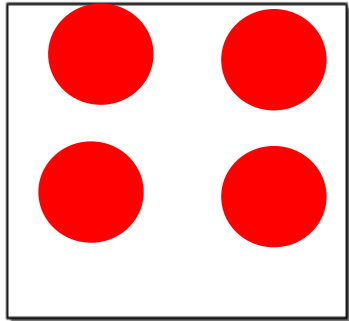
2. In the Mass and Volume experiment 10 g sample of the silver metal had a volume of 37 cm^3 , whereas 10 g sample of the red metal had a volume of 14 cm^3 . **Draw a particle diagram that explains why the samples have the same masses, but different volumes. Explain your diagram.**



Red metal



silver metal



The red metal has a more massive particle in a smaller volume than the silver metal, hence red is more dense than silver. Different particles have different densities.

Chemistry Bell Work, Tuesday, Apr 10, 2 questions

1. See Unit 1 Worksheet 3, Question 4 c

If you put 10.0 mL of A in one balance pan, what mass of B would you need in the other pan to make it balance?
Explain your reasoning.

Density of A: 1.6 g/mL, Density of B: 0.5 g/mL

Density of A = 1.6 g/mL

Need to calculate the mass of 10 mL of A.



$$D = \frac{m}{V}$$

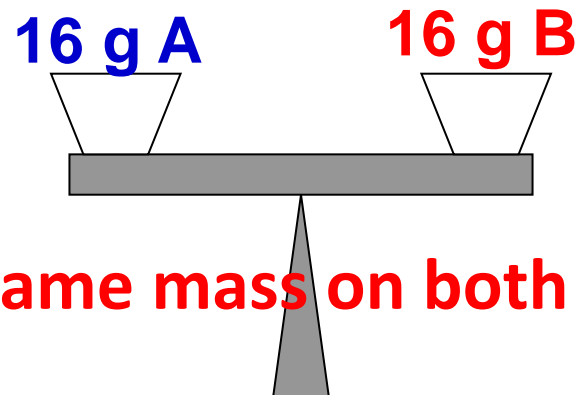
$$m = D \bullet V$$

$$m = ?$$

$$V = 10 \text{ mL}$$

$$D = 1.6 \text{ g/mL}$$

$$1.6 \text{ g/mL} \bullet 10 \text{ mL} = 16 \text{ g}$$



For the scale to balance, need the same mass on both sides

Chemistry Bell Work, Tuesday, Apr 10

2. See Unit 1 Worksheet 3, Question 4 d

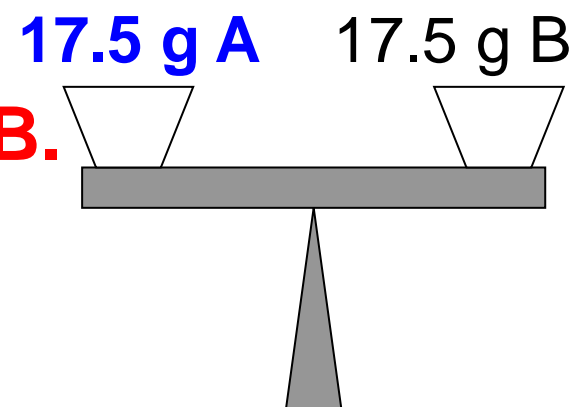
If you put **35.0 mL of B** in one balance pan, what **volume of A** would you need in the other pan to make it balance? Explain your reasoning.

Density of A: 1.6 g/mL, Density of B: 0.5 g/mL

Density of B = 0.5 g/mL

Need to calculate the mass of 35 mL of B.

$$m = D \bullet V \quad 0.5 \frac{g}{mL} \bullet 35mL = 17.5 g$$



The question asked for the volume of A, so calculate the volume of 17.5 g

$$m = 17.5g$$

$$V = ?$$

$$D = 1.6 g/mL$$

$$D = \frac{m}{V} \quad 1.6 g/mL = \frac{17.5g}{V} = 10.9 mL$$
$$V = \frac{m}{D} = \frac{17.5g}{1.6 g/mL} = 10.9 mL$$

Chemistry Bell Work, Wednesday, 4/11/11, 5 Questions

1. You are given a 1.00 kilogram sample of each.

water	1.00 g/mL
iron	7.87 g/mL
lead	11.34 g/mL

Draw the graph.

Which sample has the greatest mass?

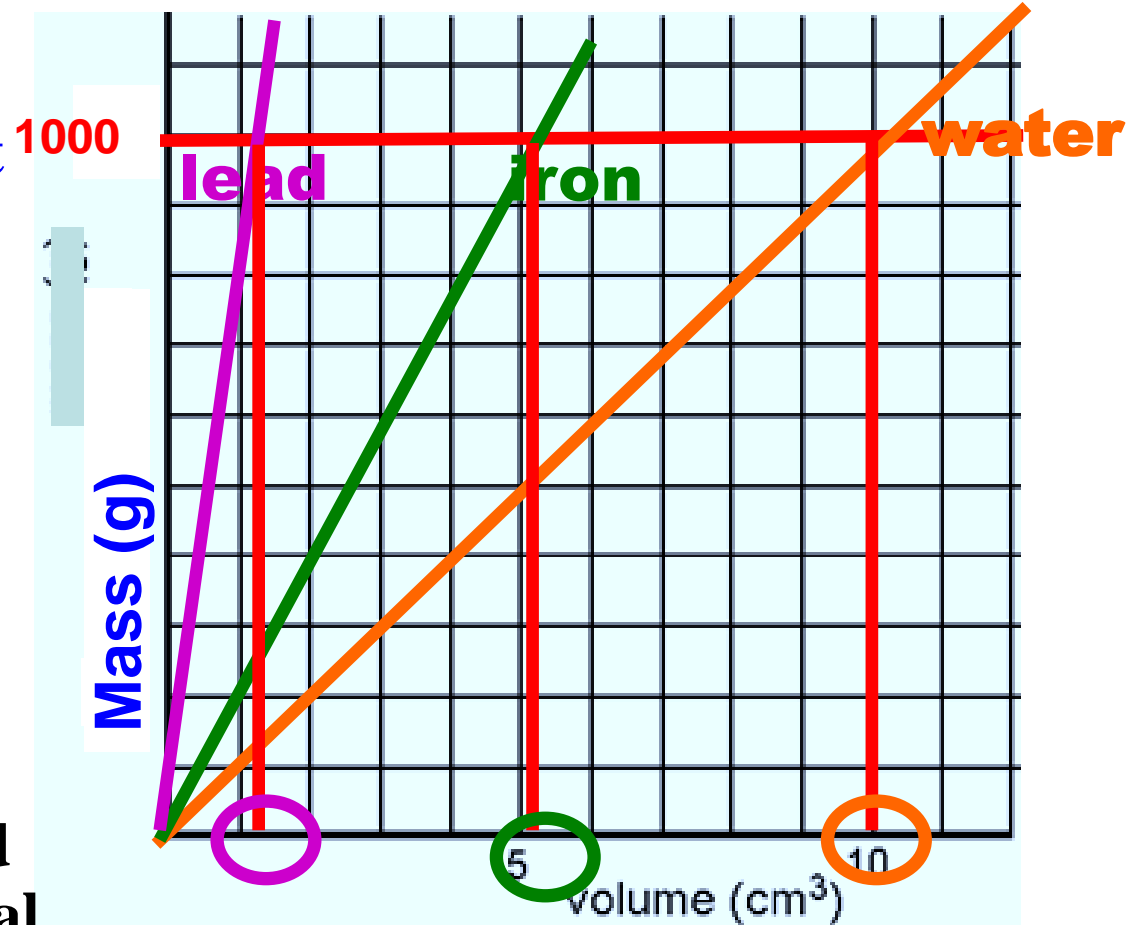
They all have the same mass.

2. Which sample has the greatest volume?

Density is the slope of the line.

1 kg of water has the greatest volume.

(note: the slopes of iron & lead are not plotted with their actual slopes. Their positions are shown relative to water.)



Volume (100 cm³)

Chemistry Bell Work, Wednesday, 4/11/11

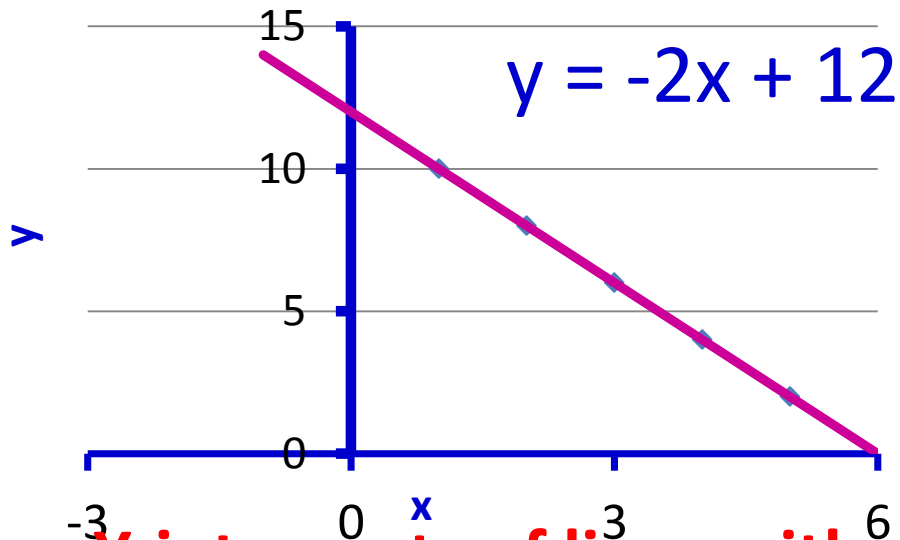
3. What does negligible mean?

Insignificant, not meaningful, and can be changed to a value of zero.

4. What is a significant y-intercept?

A y-intercept that is not negligible (cannot be changed or set to zero).

5. Is the y-intercept of this line significant? Why?



Sketch
graph &
write
equation

Yes. Y-intercepts of lines with negative slopes are always significant.



Chem Bell Work, Thursday, Apr 12

Objective: Describe the characteristics of solids, liquids and gases in terms of particles and their arrangement, attraction, and behavior.

1. What are the three states of matter

Solid, liquid, gas

2. What are the three phases of matter?

Solid, liquid, gas

3. List some phase changes.

gas → liquid

liquid → gas

solid → liquid

liquid → solid