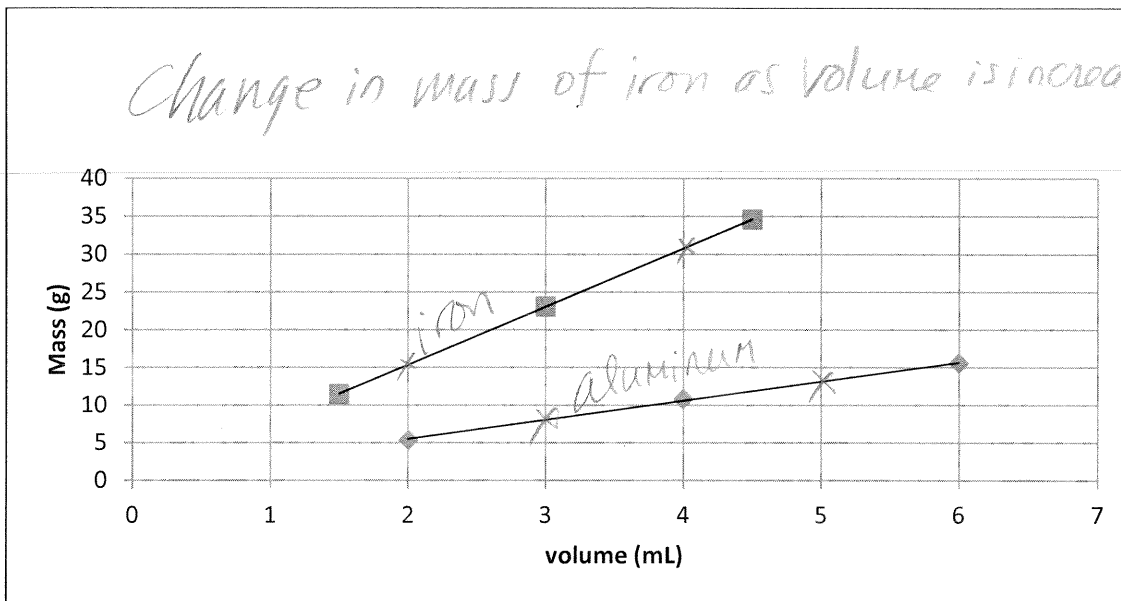


Don't Be Dense! (get it?)

Use the graph below to answer questions 1-3.



1. A chemistry student measured the mass and volume of 3 different samples of iron metal and 3 different samples of aluminum metal. The data is graphed above. Write an "excellent" title on the graph.

2. Iron metal is more dense than aluminum metal. Label each line as iron or aluminum and explain your choice.
Iron: greater incr in mass per mL of volume so greater D

3. Based on the lines graphed, determine the mass of an iron and an aluminum sample that both have a volume of 4.0 mL?

Iron: *26 g* Aluminum: *11 g*

4. Calculate the slope of the line for each metal.

Iron $\frac{31-15}{4-2} = \frac{16}{2} = 8 \frac{g}{mL}$ *Al:* $\frac{8-3}{5-3} = \frac{5}{2} = 2.5 \frac{g}{mL}$

5. What is the significance of the slope shown by this graph? Does the slope confirm your choice in (2)?

slope = density *(yes, Fe has > D*

Show all of your work in solving the following problems. Put a box around your answer. You may need to use densities given or calculated in previous questions.

6. A sample of pure gold occupies a volume of 3.00 mL and has a mass of 57.92 g. What is the density of gold?

$$D = \frac{57.92 \text{ g}}{3.00 \text{ mL}} = 19.3 \frac{\text{g}}{\text{mL}}$$

7. If you buy your mother a gold necklace for her birthday (which you should do) and it has a mass of 22.8 g, what will the volume be?

$$19.3 = \frac{22.8 \text{ g}}{x}$$

$$\text{Vol} = 1.81 \text{ mL}$$

8. A piece of lead has a mass of 22.8 g and a volume of 2.10 cm³. What is the density of lead? If a larger piece of lead were measured, what would the density be? Why?

$$10.9 \frac{\text{g}}{\text{cm}^3}$$

Same

9. Another piece of lead has a volume of 5.65 mL. What is the mass of this piece?

$$61.6 \text{ g}$$

10. Which would have a larger mass, 10 mL of gold or 10 mL of platinum? Explain.
D of platinum = 21.45 g/mL

larger D so mass per vol is higher

11. The density of iron is 7.9 g/cm³. If all the nails in a box have a combined mass of 3,160 g and a combined volume of 400 cm³, are the nails pure iron?

Yes

$$D = 7.9 \frac{\text{g}}{\text{cm}^3}$$

12. Silver is often added to gold to make the gold "white." Does adding silver increase or decrease the density of gold? Explain.
D of silver = 10.5 g/mL

silver is less dense than gold which lowers D of gold