

Chemistry in Context

Seventh Session - Chapter 5 Part 2

Answers to the assigned study questions and problems (16-17, 19 21):

16. Considering these liquids:

Liquid	density, g/mL.
Dishwashing detergent	1.03
Maple syrup	1.37
Vegetable oil	0.91

- a. If you pour equal volumes of these three liquids into a 250 mL. graduated cylinder, in what order leave at the lead was to create three separate layers? Explain your reasoning

Answer: the heavier or more dense materials should be placed in a graduated cylinder first. There for the maple syrup should go in first followed by the dishwashing detergent and then finally followed by the vegetable oil. The higher density items are heavier and will remain in the layers as they are added as the lighter items will float on top.

- b. If an unknown liquid or poured into the cylinder and it formed a layer that was on the bottom of the other three letters, what can you tell about one of the properties of the unknown liquid?

Answer: if an unknown liquid is added and it forms a layer completely on the bottom we now know that is more dense than the dances item in the container.

- c. What would happen if a volume of water equal to the other liquids were poured into the cylinder in part 8 and then the contents are mixed vigorously? Explain.

Answer: if we were to add more water and shake the mixture vigorously the maple syrup and detergent would mix with the water. The oil might float to the surface, depending upon the amount of detergent that was in the container. If there was enough detergent and water the oil would be dissolved.

17. Why is there a possibility of a water pipe breaking if the pipe is left full of water during extended frigid weather?

Answer: One of the characteristics of water which is unlike most other materials is the fact that water expands when it freezes. As a result a closed pipe full of water would probably burst if the water became frozen completely.

19. Solutions can be tested for conductivity. Predict what will happen when each of these day lead solutions is tested for conductivity

- a. $\text{CaCO}_3(\text{aq})$ Answer: strong conductor
- b. $\text{C}_2\text{H}_5\text{OH}(\text{aq})$ Answer: would not conduct
- c. $\text{H}_2\text{SO}_4(\text{aq})$ Answer: strong conductor

21. Predict the formula and give the name of the ionic compounds formed by the reaction of each pair of elements.

- a. Na and S Answer: Na_2S
- b. Al and O Answer: Al_2O_3
- c. Ga and F Answer: GaF_3
- d. Rb and I Answer: RbI
- e. Ba and Se Answer: BaSe