Chemistry Module 9 Homework

Assignment #1 **Read pages 285 – 297.**

1. What does VSEPR stand for?
2. What causes some molecules have a three-dimensional shape?
3. List the five VSEPR shapes and the bond angle for each.
4. Determine the shape and bond angle of a CH_4 molecule. Draw the Lewis diagram.
5. Determine the shape and bond angle of a NBr_3 molecule. Draw the Lewis diagram.
6. Determine the shape and bond angle of a H_2 molecule. Draw the Lewis diagram.
7. Determine the shape and bond angle of a $SiCl_4$ molecule. Draw the Lewis diagram.
8. Determine the shape and bond angle of a H_2S molecule. Draw the Lewis diagram.
9. Determine the shape and bond angle of a CS_2 molecule. Draw the Lewis diagram.
10. Determine the shape and bond angle of a CH_2 molecule. Draw the Lewis diagram.
11. Determine the shape and bond angle of a CF_3Cl molecule. Draw the Lewis diagram.

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Assignment #2 **Read pages 298 – 308.**

12. What causes some covalent bonds to be polar?

13. If two different atoms are bonded together with a purely covalent bond, what can you say about the electronegativities of the two atoms?

14. "Oil and water don't mix" is a phrase used to explain why very different people don't get along. Use polarity to explain why oil and water do not mix.

15. Why does soap help to wash away stains that water cannot wash away by itself?

16. Determine if the molecule is ionic or covalent. Draw the Lewis diagram for each covalent molecule, including arrows to show polarity. Classify the covalent molecules as polar covalent or nonpolar covalent:

    a. CCl_4

    b. NF_3

    c. H_2

    d. $CaCl_2$

    e. $SiFCl_3$

    f. SiO_2

17. Polar substances, like water, will dissolve polar and ionic molecules. Which of the substances in the previous problem would you expect to dissolve in water?

18. Honors - Why are the bond angles in a pyramidal shape smaller than the bond angles in a tetrahedral shape?