Section 3B: Petroleum: A Building Material Source

Name: _____

Part 1: Valence Electrons

1. Define valence electrons.

2. Draw the lewis dot structure for:
   a. Magnesium b. Nitrogen

3. How many valence electrons do most atoms want to have? _____
   - How many valence electrons do hydrogen and helium want to have? _____

Part 2: Lewis Dot Structures

4. When atoms transfer electrons within a molecule, it is called an _____ bond.
   a. What kind of elements must a molecule have to be held together by ionic bonds?

   b. What holds atoms together in an ionic molecule?

   c. Draw a molecule of sodium chloride, showing the ionic bonds.

5. When atoms share electrons within a molecule, it is called a _____ bond.
   a. What kind of elements must a molecule have to be held together by covalent bonds?

   b. What holds atoms together in a covalent molecule?

   c. Draw a molecule of ammonia (nitrogen trihydride), showing the covalent bonds.

Part 3: Petrochemicals

6. How many electrons are shared in a double bond? _____
7. Define builder molecule:

8. Draw ethene:

9. Define polymer:

10. List the steps needed to make an addition polymer.

11. Draw a straight chain polymer: A branched polymer: A polymer with cross-links:

12. Explain two effects that branching has on polymers.

13. Explain two effects that cross-linking has on polymers.

Part 4: Alkenes and Alkynes

14. Explain the difference between alkanes, alkenes, and alkynes, in terms of bonds and saturation.

15. Draw 2-pentene: 3-hexyne 2,4-nonadiyne

Part 5: Functional Groups

16. What is the functional group for:

What does the functional group look like?	a. alcohols	b. carboxylic acid	c. ester	d. ether
Give an everyday example.				

17. What is the shape of a cycloalkane? _____

18. Draw cyclopentane: cyclohexene:

Part 6: Condensation Polymers

19. Define condensation polymer.

20. Write a generic reaction for the creation of a condensation polymer.