Section 3B Review

Name: _____

1) What are petrochemicals? What are they used to build?

Petrochemicals are compounds from petroleum that are not very good fuels, but can be used to make other materials. They can be used to build plastics cleaning agents and medicines.

2) What is a monomer? What is a polymer?

A monomer is a building block of a polymer that contains a double bond. A polymer is created when many monomers attach together.

3) What is the process of making a polymer?

A catalyst breaks one of the bonds in the monomer's double bond, revealing two bonding sites. The monomers then repetitively attach to each other making a longer and longer chain, which ends up being a polymer chain.

4) How do you make different plastics using the process above?

Different plastics are made by starting with different monomers. By replacing one of the hydrogens on the ethene monomer with something else, the plastic's consistency and properties change.

5) What is the maximum number of electrons held by the first electron shell? The second?

2 in the first shell, 8 in the second shell.

6) Draw Lewis dot structures of carbon, hydrogen, nitrogen and oxygen.

Element	H	C	N	O
Symbol	H	C	N	O

7) How do covalent bonds hold atoms together? What is the magic number for valence electrons?

Covalent bonds hold atoms together by sharing electrons between atoms. Each atom donates one electron to the sharing. Once shared, both atoms can claim the electrons, attempting to get to the magic number of 8 electrons.

8) Draw a Lewis dot structure for the following covalent compounds:

a) CO_2

b) NH_3

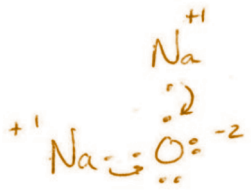
9) How do ionic bonds hold atoms together? What is the magic number for valence electrons?

Ionic bonds hold atoms together by transfering electrons between atoms. One atom will give up electrons to achieve zero valence electrons, while the other one gains the electrons to get to eight

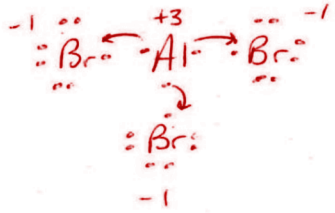
valence electrons. This causes opposite charges that attract to one another, causing the ionic bond. Atoms need to get to either 0 or 8 electrons..

10) Draw a Lewis dot structure for the following ionic compounds:

a) Na_2O



b) $AlBr_3$



11) When a line is connecting two atoms, depicting a bond, how many electrons are represented by that line?

2 electrons, one from each atom.

12) What is a valence electron?

Valence electrons are electrons in the outermost energy level or shell of an atom. They are the farthest from the nucleus of the atom, and they are the electrons used in bonding.

13) Complete the table:

	Type of bonds seen	Number of atoms bonded to carbon atoms	Saturated or unsaturated
Alkanes	single	4	saturated
Alkenes	double	3	unsaturated
Alkynes	triple	2	unsaturated

14) Draw a pentane, pentene, and pentyne molecule. Label each drawing with its molecular formula.

Pentane	Pentene	Pentyne
CH_3-CH_2-CH_2-CH_2-CH_3	CH_2=CH-CH_2-CH_2-CH_3	CH≡C-CH_2-CH_2-CH_3
C_5H_{12}	C_5H_{10}	C_5H_8

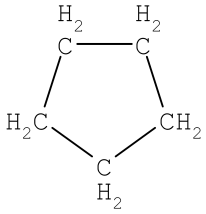
15) What do the following prefixes mean?

Meth: 1
Hex: 6
Prop: 3
Pent: 5
But: 4
Oct: 8
Eth: 2
Dec: 10

16) How does 1-pentene differ from 2-pentene?

The double bond is in a different place. In 1-pentene, the double bond is between the first and second carbon. In 2-pentene, the double bond is between the second and third carbon.

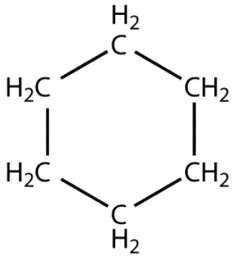
17) What is the molecular formula for cyclopentane? (Hint: draw it out)

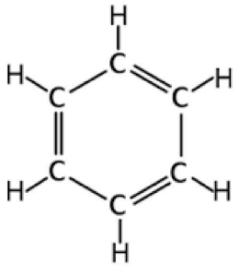


C_5H_{10}

18) Draw cyclohexane. Explain how this is different from cyclohexene..

Cyclohexene would have a double bond on every other carbon, like this--->





19) Next to each of the following molecules, indicate whether they are saturated or not. (Hint: if you don't remember the formulas, try drawing them out.)

C_6H_{12} unsaturated
C_5H_{12} saturated
C_5H_{10} unsaturated
C_6H_{14} saturated

20) Draw the structure for an alcohol, a carboxylic acid, an ester, and an ether.

Functional group	Labeled in blue:
alcohol	CH_3CH_2OH
carboxylic acid	CH_3COH (O double bonded)
ester	CH_3COCH_3 (O double bonded)
ether	$H_3CH_2COCH_2CH_3$

21) A condensation ester is made by mixing a carboxylic acid with an alcohol. When this reaction happens, what other product is formed? Where do each of the elements in this product come from?

Water is the other product. Water is made when a H- from the carboxylic acid reacts with the -OH alcohol group from the alcohol to make HOH, or H_2O.