# Review – Section 3B & 3C

Name: _____

1) Using the following reaction, how much heat is absorbed when 3 g of iron is added to excess carbon dioxide?   $2 Fe + 3 CO_2 \longrightarrow Fe_2O_3 + 3 CO$  $\Delta H = +26.8$ kJ

2) How many grams of ammonia must be burned in order to release 305 kJ of heat according to the reaction:  $4 NH_3 + 5 O_2 \longrightarrow 4 NO + 6 H_2O$  $\Delta H = -905.4$ kJ.

3) Define the difference between an endothermic and exothermic reaction in terms of both the heat and the enthalpy.

4) Describe the process of cracking?

5) Gasoline is a mixture.  What is gasoline a mixture of?

6) What is the octane rating for gasoline?  What are the different formulations of gasoline in terms of octane rating?

7) What are the advantages and disadvantages of adding additives that oxygenate fuels?

8) Name the 3 types of alternative car engines and how they are designed to save natural resources and/or are environmentally better?

9) Describe the difference between a monomer and a polymer, and how they are related to one another.

10) How is an unsaturated hydrocarbon different from a saturated hydrocarbon?  Give an example of each.

11) The basic formula for an alkane is $C_nH_{2n+2}$.  What is the basic formula for an alkene and an alkyne?

12) Label each for the following based on its type of molecule.

     A. $CH_3$-$CH_2$- $CH_2$- $CH_2$- $CH_2$- $CH_2$-$CH_3$          B.   $CH_3$- $CH_2$- $CH_2$
                                                                         |
                                                                       $CH_3$

     C.   $CH \equiv C$- $CH_2$- $CH_3$

     D.      $CH_3$                               E.   $O=C$-$O$-$CH_3$
              |                                               |
     $CH_3$- $CH_2$- $CH_2$- $CH_2$- $CH_3$               $CH_2$- $CH_2$- $CH_2$- $CH_3$

13) Give a common example of each of the following.

a) carboxylic acids _____ b) esters _____

c)) alcohols _____ d) polymers _____

e) alkanes _____


14) Are alkanes more or less chemically reactive than alkynes?  Explain your reasoning.

15) Draw structures for the following compounds:

   a) cis-1,2 dimethyl-1-hexene            d) cycloheptane

   b) 2,6-dibromooctane                e) 1-butyne

   c) 1-propene                       f) 2,4-heptene

   d) 2-pentanic acid                 h) 4-decanol

16) Write the names for the following compounds.

a)
$$CH_3$$
$$|$$
$$CH_3\text{-}CH\text{-}CH_2\text{-}CH_2\text{-}CH_2\text{-}CH\text{-}CH$$
with branches: $CH_3$ $CH_3$ on the CH-CH portion, and
$$|$$
$$CH_2\text{-}CH_2\text{-}CH_3$$

b)
$$CH_3\text{-}CH= CH\text{-}CH= CH_2$$

c)
$$CH_3\text{-}C\equiv C\text{-}CH_2\text{-}CH_2\text{-}CH_2\text{-}CH_3$$

d)
$$CH_3$$
$$|$$
$$CH_3\text{-}CH_2\text{-}CH_2\text{-}C=C\text{-}CH_2\text{-}CH_2\text{-}CH_3$$
$$|$$
$$CH_3$$

e)
$$CH_3\text{-}CH\text{-}CH_2\text{-}CH_2\text{-}CH_3$$
$$|$$
$$O=C\text{-}O\text{-}CH_3$$

f)
$$CH_3\text{-}CH_2\text{-}OH$$

17) Describe the process necessary to make a polymer, such as polyvinyl chloride (PVC), using an addition reaction.  To help explain yourself, it may be helpful to show the changes in the structures of the molecules.

18) In all forms of electricity generation except solar panels, how is the electricity made?

19) Describe the three types of energy and give one example in which one type of energy is transformed into a different type of energy.

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