

## CHEMISTRY DAILY PLAN

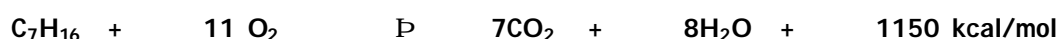
**Class:**

**Date:**

**Subject:** *Reactions of Alkanes*

**Time:**

Alkanes are relatively inert; they have little affinity for most chemical reagents. They are insoluble in water and do not react with aqueous solutions of acids or alkalis. Alkanes do not react with oxidizing or reducing agents. However, alkanes do react with some reagents such as oxygen and the halogens.

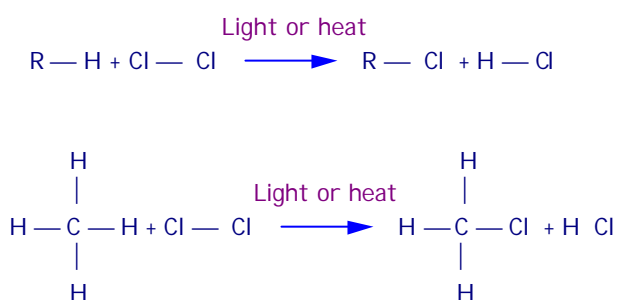


The most important use of alkanes is as fuels. Alkanes burn in an excess of oxygen to form carbon dioxide and water. The reactions are exothermic.

These combustion reactions are the basis for the use of hydrocarbons for heat (natural gas) and for power (gasoline).

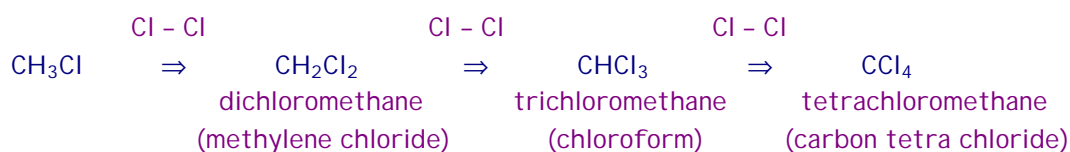
### HALOGENATION

A mixture of an alkane and chlorine or bromine can be kept at low temperatures in the dark; no reaction occurs. In sunlight or at high temperatures, however, an exothermic reaction takes place. Hydrogen atoms in the alkane are replaced by halogen atoms. The reaction is called halogenation. (chlorination or bromination). The reaction can be represented by the general equation:



Reactions such as halogenation of alkanes, in which one atom or group is replaced by another, are called substitution reactions.

Side reactions and by products are often associated with substitution reactions. For example, the methyl chloride may react with chlorine, giving rise to the following products:



**Problem:** Write the names and structures of all possible products of bromination of ethane.

**Problem:** How many grams of chlorine gas are required to obtain 30.8 g of carbon tetra chloride by the complete substitution reaction of methane? What is the volume of methane required for this reaction at STP?