**Halogenation of Alkanes: Relative Rates of Free- Radical Bromination**

**Introduction**

In this particular lab experiment, a free radical bromination would be used in order to verify the relative relativities of various types of C-H bonds toward hemolytic cleavage. Six hydrocarbons will be sued in this study:

When each one of these hydrocarbons are added to bromine, then these products form:



***Safety Precautions***

*Bromine in its non-diluted form is a poison, and oxidizer, and corrosive. The bromine that is being using in this lab is a dilute form, however, it is still harmful, less but still harmful. You need to wear goggles, protective clothing, and gloves at all time. Make sure to do the reactions in the student hood. Also, all the hydrocarbons are flammable. Methylene chloride is a moderate health hazard.*

***Wastes***

*All waste goes in the organic waste in the main hood.*

**Procedure**

1. You will be working in groups of 3-4 students.
2. The whole group needs 12 vials
3. Label six vials each with the name of each of the hydrocarbons.
4. Use the measuring burets in the main hood to place 1ml of each hydrocarbon in their respective vials.
5. Measure 1 ml of bromine/methylene chloride solution and place it in the remaining six vials
6. Place the heating mantle under the student hood and plug a light bulb into it.
7. Place a crystallizing dish of cold water in the position close to the light bulb.
8. Turn the heating mantle to 8
9. Note the time
   1. Add the hydrocarbon solutions to the bromine solutions in quick succession mix and then place the vials in the dish of cold water.
10. Observe the vials carefully and record the time required for each solution to decolorize, indication of the reaction with bromine
11. After 15 minutes, place the hydrocarbon solutions that have not yet decolorized into a dish of hot tap water, again near the light source.
12. Observe and note the times required for decolorization.
13. Experiment may be discontinued when only one hydrocarbon solution remains colored.