

5.14: SOLUTIONS TO ADDITIONAL EXERCISES

KINETICS AND THE RATE EQUATION

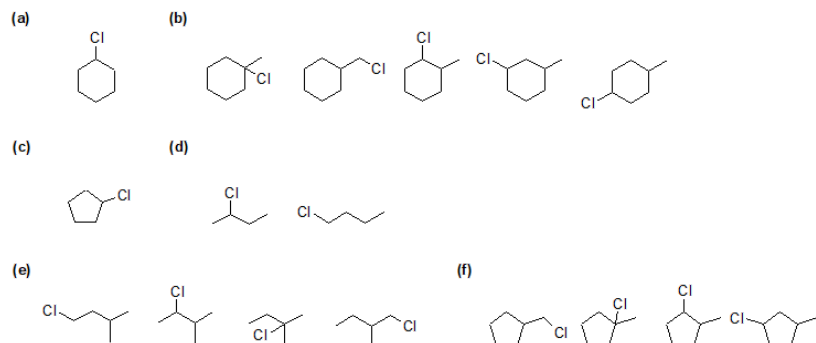
5-1 The rate equation is an experimentally derived equation that explains the relationship between the concentration of reactants and the rate of the reaction.

5-2 $\text{Rate} = k [\text{A}]^m [\text{B}]^n$

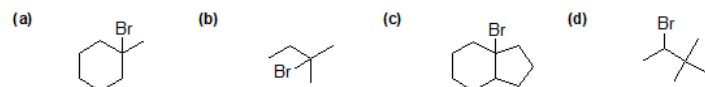
5-3 Overall order = 1.5

HALOGENATION OF ALKANES

5-4



5-5



5-6 Radical bromination is more selective because of its slightly higher activation energy required to break a C-H bond during the propagation steps (when the bromine radical abstracts a proton from the substrate). Though the difference in activation energy is not huge ($\text{Cl} = \sim 1 \text{ kcal/mol}$ and $\text{Br} = \sim 3 \text{ kcal/mol}$), it leads to a significant difference in selectivity.

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