

## Answer on Question #80372, Chemistry/ Organic Chemistry

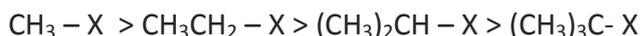
Among alkyl halides, order of reactivity of SN2 reaction is



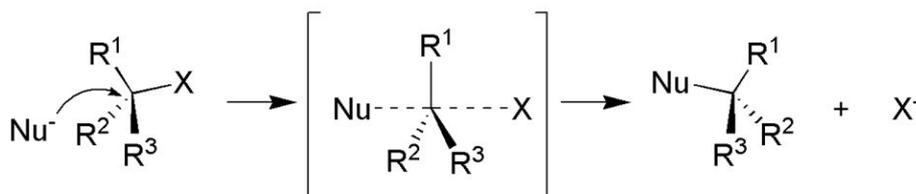
Discuss the factors which are mainly responsible for this order.

### Answer

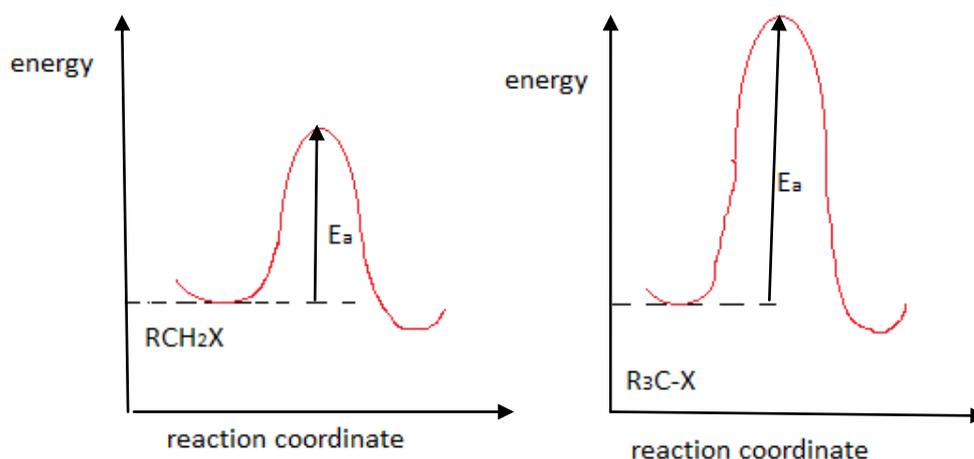
The relative reactivity of a molecule in a SN2 mechanism depends on its structure. The reaction rate for alkyl halides is



Two distinct effects are responsible for this order of reactivity: electronic and steric effects. But steric effects have a major role. As hydrogen atoms of methyl group are gradually replaced by bulkier alkyl groups, the nucleophile finds it more and more difficult to push in through the three carbon substituents in order to form the transition state.



If the substituents are bulky, the transition state will be heavily crowded and the nonbonded interactions between various substituents would raise its energy and make it unstable.



The steric effect is also noticed, when the carbon next to the reaction site is highly branched, there is a severe hindrance to the approach of the attaching group. This effect is responsible for the very low reactivity of neopentyl substrate in spite of its being primary in nature.