

Reaction 6-20 produces an alkyl radical (R) which contains a free electron. This radical quickly picks up an oxygen molecule from the air to form a peroxy radical RO₂ :



Typically, the next reaction in the series converts NO to NO₂ and produces an oxyl radical, RO :



A hydrogen abstraction by molecular oxygen may then produce a hydroperoxyl radical, HO₂. The rest of such an RO radical typical forms a carbonyl compound, OHC:



Finally, the hydroperoxyl radical (HO₂) can react with a second NO to form NO₂ to complete the cycle:



Although this description is very simplified, these series of reactions contain the essential features of NO to NO₂ oxidation and subsequent ozone formation.

The initial source of radicals is very important; although the rate and yield of oxidant formation depend on many other factors, the length of the induction period before accumulation of oxidant depends strongly on the initial concentration of radicals. (The length of the induction period is important primarily in constant light intensity smog chambers. Diurnally varying radiation tends to lessen the importance considerably.) In smog chambers and possibly in the ambient atmosphere, the