in which olefins participate are with HO radicals, ozone, and atomic oxygen, in that order. The reaction of HO with an olefin, such as propylene, may proceed by addition of OH to the double bond or by abstraction of a H-atom from the olefin. For propylene, for example, the reaction paths with HO are:

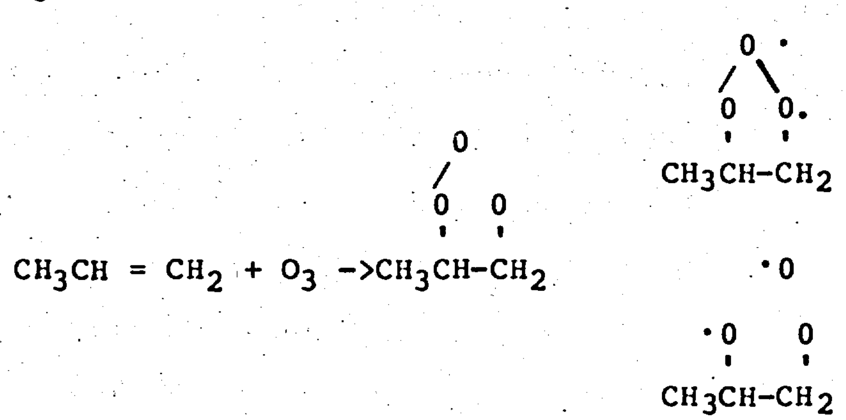
$$CH_3CH = CH_2 + HO \rightarrow CH_3CHCH_2OH \qquad (6\text{-}29a)$$

$$\rightarrow CH_3\overset{OH}{C}HCH_2 \qquad (6\text{-}29b)$$

$$\rightarrow CH_2CH = CH_2 + H_2O \qquad (6\text{-}29c)$$

In each case the free radical product will quickly react with O_2 to produce a peroxyalkyl radical that is capable of converting NO to NO_2.

Ozone-olefin reactions are a source of free radicals and stable products in air pollution chemistry. The initial attack of O_3 on an olefin produces an unstable intermediate, which may decompose by several pathways.[10,11] For propylene, for example, the initial step in the reaction with O_3 is believed to be:



(6-30)

Subsequent de-composition of the products leads to a variety of free radicals and stable products.[12,13] The mechanisms of ozone-olefin reactions are still under considerable study,