photolysis of nitrous acid, reaction 6-17, may be the most important initial source of radicals. Nitrous acid has been detected in smog chambers in concentrations sufficient to explain the observed induction time for smog chemistry, but the concentrations necessary to initiate smog chemistry in the atmosphere are below the limits measured by most modern instruments.

Another possible source of radicals in the atmosphere is the photolysis of aldehydes:

$$RCHO + h\nu \rightarrow HCO + R \qquad (6\text{-}25)$$

Aldehydes are emitted from many sources, including automobiles. They are also formed in smog.

During the course of the overall smog formation process, the free radical pool is maintained by several sources, but the dominant one appears to be photolysis of the aldehydes formed from the initial hydrocarbons. Since the reactions of free radicals with NO form a cyclic process, any additional source of radicals will add to the pool and increase the cycle rate. Conversely, any reaction that removes free radicals will slow the cycle rate. For example, a primary radical sink and a primary sink for oxides of nitrogen is reaction 6-18 to form nitric acid.

The hydrocarbon classes important in the chemistry of the polluted troposphere are alkanes, olefins, and aromatics. In addition, the oxygenated hydrocarbons, such as aldehydes, ketones, esters, ethers, and alcohol are also important. A great variety of chemical reactions take place among these