

Peterson<sup>54</sup> indicates that for species such as  $\text{NO}_2$ , HONO,  $\text{H}_2\text{O}_2$ ,  $\text{O}_3$ , and formaldehyde, extensive experimental determinations of absorption cross sections and quantum yields are fairly reliable. However, since cross section and quantum yield data for higher aldehydes, alkyl nitrites and other carbonyl compounds are much less well characterized, these photolysis rate constants are subject to a large uncertainty. Of course, even if absorption cross sections and quantum yields could be determined accurately for all photo-sensitive species, uncertainties in atmospheric photolysis rate constants would still exist, as meteorological conditions, clouds, dust, and aerosols cause unknown variances in actinic irradiance.

Whereas rate constants in the inorganic portion of the mechanism are known fairly well, many more uncertainties, both in reaction rate constants and products, are associated with the organic reaction steps. Still to be determined are product distributions and reaction rate constants for the initial steps of the reactions of OH and hydrocarbon species, the largest uncertainties lying in the routes of the various radical species produced. For example, although rate constants for alkane-OH reactions are well established, the ratio of internal to external abstraction for all alkanes is not known. Addition to  $\text{O}_2$  to form peroxyalkyl ( $\text{RO}_2$ ) radicals can be considered as the sole fate of the alkyl radicals first produced