Thus, PAN chemistry is intimately interwoven in the NO to NO_2 conversion process. Rate constants for reactions 6-42 and 6-43 have recently been reported by two groups of investigators.[25,26]

The chemistry of the oxides of nitrogen in a hydrocarbon-containing atmosphere can be summarized as follows: the major observed phenomenon in the system is conversion of NO to NO_2 and formation of a variety of nitrogen-containing species, such as nitrites and nitrates. The conversion of NO to NO_2 is accompanied by accumulation of O_3. NO_2 serves as both as initiator and terminator of the chain reactions that result in conversion of NO to NO_2 and buildup of O_3. Termination of the chain reactions leads to nitric acid and organic nitrates. The nature of the system can be explained by considering its behavior as a function of the initial concentrations of NO_x and hydrocarbon in the irradiation of a static system, as well as the ratio of two reactants, i.e., the $[HC]/[NO_x]$ ratio.

At low $[HC]/[NO_x]$ ratios (usually ratios of less than about 1 to 2:1) the rate at which NO is converted to NO_2 is influenced by the availability of organic compounds. Therefore, the effects of reducing organic compounds are to slow the conversion of NO to NO_2, thereby lowering the NO_2/NO ratio. When this occurs, a larger proportion of the NO that is converted to NO_2 occurs through the destruction of ozone. This then has the overall effect of reducing the rate of ozone formation. If the oxidation of NO by organics is delayed