

Repta and Beltagy (1981) reported on the oxidation of 6-seleno guanosine in aqueous solution. Underberg (1978) reported on the oxidative degradation of promethazine. Duchene et al. (1986) have reviewed the effect of cyclodextrin complexes on drug oxidative stability. Szejtli et al. (1980) and Szejtli and Bollan (1980) demonstrated that for vitamin D₃ the cyclodextrine complex reacted less rapidly with oxygen. Swarbrick and Rhodes (1965) showed that the maximum oxidation rate of linoleic acid in aqueous systems containing the surfactant Brij 35 was a slightly decreasing linear curve.

Sadhale and Shah (1998) reported on the hydrolysis and oxidation of cefazolin at low (50 $\mu\text{g/g}$) and high (200 $\mu\text{g/g}$) concentrations. Under some of the conditions the plots are S-shaped or have downward curvature; in other cases the plots appear semilogarithmic. EDTA slows down the reaction, and if gels are present the degradation constants are 3–18 times lower. In the latter case, the reduced oxygen diffusion may be the reason. Similar results were obtained, although to a lesser degree, with cefuroxime.

2. MORE COMPLEX MODELS

A more general, semi-empirical equation for the treatment of autoxidative reactions (invoking some power dependence of Y and $(1 - Y)$ is

$$\ln \left\{ \frac{Y^n}{(1 - Y)^p} \right\} = -k'(t - t_i) \quad (4.50)$$

A more manageable form of this equation is

$$\ln \left\{ \frac{Y^q}{1 - Y} \right\} = -k(t - t_i) \quad (4.51)$$

where

$$k = \frac{k'}{p} \quad (4.52)$$

and

$$q = \frac{n}{p} \quad (4.53)$$

The problem exists as to how to treat Eq. (4.51) and obtain parameters from the untransformed Y versus t equation, since n and p and k are not known. The reason for recasting Eq. (4.50) is to reduce the number of iterants to one. Large number of iterants in a model are suspect, because even good but not quite rigorous first estimates may lead to secondary minima, and it is always a good practice to reduce the iterants to as few as possible. Equation (4.51) only requires one iterant, so that data treatment is not all that questionable.*

* Iteration with more than one iterant always leaves the question of whether the minimum obtained by iteration is a primary or a secondary minimum. An example of this is shown in Chapter 3.