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APPENDIX

STATISTIC CALCULATION METHODS

1. Mean, $\bar{X}$

$$\bar{X} = \frac{\Sigma X}{n}$$

n = number

2. Standard deviation, S.D.

$$S.D. = \sqrt{\frac{\Sigma (X-\bar{X})^2}{n-1}}$$

3. The Coefficient of Variation, C.V.

$$C.V. = \frac{S.D.}{\bar{X}}$$

4. Correlation coefficient, r

The best fitted straight line is determined by the least square method

$$r = \frac{(n\Sigma XY)-(\Sigma X)(\Sigma Y)}{\sqrt{[n\Sigma X^2-(\Sigma X)^2][n\Sigma Y^2-(\Sigma Y)^2]}}$$

Y = concentration of drug

X = the corresponding time

5. Specific rate constant

The slope of the straight line is a specific rate constant that can be calculated from

$$K = \frac{n\Sigma XY-(\Sigma X)(\Sigma Y)}{n\Sigma (X)^2-(\Sigma X)^2}$$

The 95% confidence limit of slope is obtained from

$$K \pm t_{1-.025} S_k$$

Standard Error of the Estimate, S_k

$$S_k = \sqrt{\frac{S^2_{y/x}}{\Sigma (X_i - \bar{X})^2}}$$

$$S^2_{y/x} = \frac{\Sigma (Y_i - Y_c)^2}{n-2}$$

Y_i = actual value

Y_c = predicted value

6. The predicted rate

The predicted rate at room temperature (20°, 25°, and 30°C) are obtained by extrapolated the Arrhenius plot and the 95% confidence limits of prediction are calculated

$$\ln[Y \pm t_{1-.025} S_y] = \ln\left[Y \pm t_{1-.025} S_{y/x}\left(\sqrt{\frac{1}{n} + \frac{(X_p - \bar{X})^2}{\Sigma (X_i - \bar{X})^2}}\right)\right]$$

X_p = the extrapolated temperature^{-1} (20°, 25°, 30°, 35°C)

$\bar{X}$ = the average of (temperature studies)$^{-1}$ in Arrhenius plot

n = the number of temperature studies.

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