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APPENDIX

K-Value of Povidone

Weigh accurately a quantity of undried Povidone equivalent on the anhydrous basis to the amount specified in the following table:

Nominal K-value	g
<18	5.00
>18	1.00

Dissolve it in about 50 ml of water in a 100-ml volumetric flask,dilute with water to volume, and mix. Allow to stand for 1 hour. Determine the viscosity, using a capillary-tube viscosimeter of this solution at 25±0.2°C. Calculate the K-value of Povidone by the formula:

$$[\sqrt{300c \log z + (c + 1.5c\log z)^2} + 1.5c \log z - c]/(0.15c + 0.003c^2),$$

in which c is the weight, in gm, on the anhydrous basis, of the specimen tested in each 100.0 ml of solution, and z is the viscosity of the test solution relative to that of water.

Statistics

The comparison of more than two treatments, using randomized block desings.

Table of results from randomized block design, general

		treatments							block
		1	2	...	...	t	...	k	average
	1	y_{11}	y_{21}	...	...	y_{t1}	...	y_{k1}	
	2	y_{12}	y_{22}	...	...	y_{t2}	...	y_{k2}	
	.	...	...	...	...	...	..	...	
block	i	y_{1i}	y_{2i}	...	...	y_{ti}	..	y_{ki}	Y_i
	.	...	...	...	...	...	..	...	
	n	y_{1n}	y_{2n}	...	...	y_{tn}	..	y_{kn}	
treatment average						Y_t			Y=grand average

Table of Analysis of variance for randomized block design.

Source of variation	sum of square	degree of freedom	mean square
average	$S=nkY^2$	1	
between blocks	$S_B=k\sum_{i=1}^{n}(Y_i-Y)^2$	n-1	$S_B^2=S_B/n-1$
between treatment	$S_T=n\sum_{t=1}^{k}(Y_t-Y)^2$	k-1	$S_T^2=S_T/k-1$
residuals	$S_R=\sum_{i=1}^{n}\sum_{t=1}^{k}(y_{ti}-Y_i-Y_t+Y)^2$	(n-1)(k-1)	$S_R^2=\frac{S_R}{(n-1)(k-1)}$
total	$S=\Sigma\Sigma y_{ti}^2$	N=nk	

ratio of mean square (F) between block = S_B^2/S_R^2

between treatment = S_T^2/S_R^2

The 95% confidence interval of slope

$$b \pm t_{(1-\alpha/2)} Sb$$

$$df = n-2$$

$$Sb = \frac{S^2_{y/x}}{(Xi-\bar{X})^2}$$

$$S^2_{y/x} = \frac{(Yi-Yc)^2}{n-2}$$

$$= \frac{(1-r^2)[\Sigma (Yi-\bar{Y})^2]}{n-2}$$

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