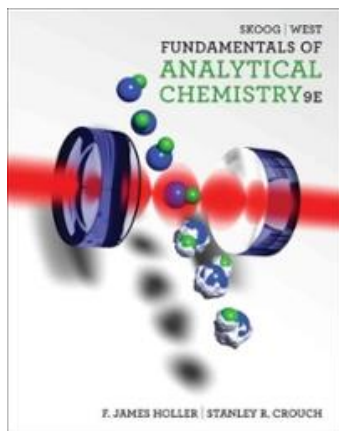


STATISTICS IN CHEMISTRY

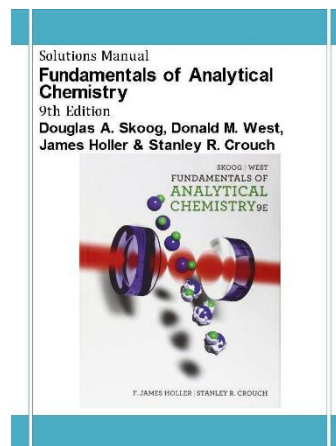


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1.



2.



1. Skoog DA, West DM, Holler FJ, Crouch SR. Fundamentals of Analytical Chemistry. Nelson Education; 2013.
2. Skoog DA, West DM, Holler FJ, Crouch SR. Solutions Manual of Fundamentals of Analytical Chemistry. Nelson Education; 2013.

Determination of Rough Errors, Q-test

Determination of Rough Errors, Q-test

One or more of the data obtained from the analysis may not be due to random errors. A number of gross errors during the course of the analysis can lead to deviations of the results. Occuring such results adversely affects both the accuracy and the precision of the analysis results. The arrival of disposing of this data cannot be done with a good decision. It is not appropriate to make a random decision to discard, especially if an error in obtaining this data is unknown and has occurred during a normal analysis course. For this reason, some statistical tests are made by applying some tests in which the data obtained does not contain any analysis results that may affect the accuracy and precision of the analysis result. The Q-test is commonly used for this purpose.

Q-test

It is a frequently used test to decide whether to discard questionable data obtained. The analysis data obtained during the application of the test are sorted from small to large. Usually the questionable data is the extremes. The spread, ω , of the absolute value of the difference with the data closest to a suspicious data itself, the ratio is called the Q value.

$$Q = \frac{|x_n - x_{(n-1)}|}{x_n - x_1}$$

This calculated value is compared with the critical Q value found in the table, depending on the number of analyzes and confidence level.

If $Q_{\text{experimental}} < Q_{\text{critical}}$, data need not be discarded. Otherwise, the data should be discarded.

Critical Values for the Rejection Quotient, Q^*

Qcrit (Reject if $Q > Q_{crit}$)

Number of Observations	90% Confidence	95% Confidence	99% Confidence
3	0.941	0.970	0.994
4	0.765	0.829	0.926
5	0.642	0.710	0.821
6	0.560	0.625	0.740
7	0.507	0.568	0.680
8	0.468	0.526	0.634
9	0.437	0.493	0.598
10	0.412	0.466	0.568