Analytical Chemistry

Chapter 3

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Activity 6

1. A class of 30 students determined the activation energy of a chemical reaction to be 27.7 kcal/mol (mean value) with a standard deviation of 5.2 kcal/mol. Are the data in agreement with the literature value of 30.8 kcal/mol at (a) the 95% confidence level and (b) the 99% confidence level? Estimate the probability of obtaining a mean equal to the literature value.

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3. Two different analytical methods were used to determine residual chlorine in sewage effluents. Both methods were used on the same samples, but each sample came from various locations, with differing amounts of contact time with the effluent. The concentration of Cl in mg/L was determined by the two methods and the following results were obtained:

Sample	Method A	Method B
1	0.39	0.36
2	0.84	1.35
3	1.76	2.56
4	3.35	3.92
5	4.69	5.35
6	7.70	8.33
7	10.52	10.70
8	10.92	10.91

(a) What type of t test should be used to compare the two methods, and why?

(b) Do the two methods give different results? State and test the appropriate hypotheses.

(c) Does the conclusion depend on whether the 90%, 95% or 99% confidence levels are used?

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