

SEE1123

INSTRUMENTATION & ELECTRICAL MEASUREMENT

Result/Data Analysis

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5.0 Error

Anyone who performed measurement will come across error.

Instrumental Error as the name implies is due to problems related to instruments or equipment. Among them are friction caused by moving parts, non-linear components, equipment which are not calibrated, and damaged equipment. Instrumental error can be minimized by calibrating instruments, choosing the right equipment, checking equipment for faulty operation or damaged parts and utilizing more than one technique for high accuracy measurements.

5.1 Absolute Error and Relative Error

By calculating percentage errors, the absolute and relative errors can be determined.

5.2 Uncertainty

Uncertainty exists in measurement due to the existence of more than one quantity in a measurement.

5.3 Chauvenet's Criterion

The Chauvenet's criterion provides a method of evaluating whether a data obtained from experiments are suitable or not.

The criterion involves 3 steps:

- 1) Calculate the mean value.
- 2) Determination of the standard deviation and variance.
- 3) Chauvenet's criterion is applied in order to determine which data should be rejected.

5.4 Least Square Method

The Least Square Method is a means of plotting a straight line across several points measured in an experiment.