

18.7 Interlaboratory studies

There are three major types of interlaboratory studies in which a group of laboratories analyzes identical test portions from a homogeneous, stable test sample. Each type is characterized by a self-defining designation according to its purpose:

- (1) *Method-performance study.* A study in which all laboratories follow the same written protocol and use the same test method to measure a property (usually concentration of an analyte) in order to assess the performance parameters of a method.
- (2) *Laboratory-performance study.* A study in which laboratories use the method of their choice to measure a property in order to assess the performance of the laboratory or analyst, usually to evaluate or improve performance.
- (3) *Material-certification study.* A study that assigns a reference value to a characteristic in the test material, usually with a stated uncertainty, using the "best" laboratories and the least-biased methods.

Vague terms such as "round-robins," "intercalibrations," "ring tests," etc., should not be used.

Each type of study requires its own statistical assumptions (model), statistical analysis, and outlier treatment. All such studies require that the laboratories be supplied with one or more *homogeneous*, stable materials to avoid confounding the results with sampling errors. It is usually undesirable to conduct a study to handle more than one of these objectives, but attaining more than one of these objectives can be an unexpected by-product.