amc technical brief

Terminology - the key to understanding analytical science.
Part 1: Accuracy, precision and uncertainty.

Over the last two decades, considerable strides have been made in constructing a single, self-consistent, conceptual scheme for quality in chemical measurement (and, indeed, all measurement). In the course of that effort, concepts are being clarified and refined, and the corresponding terminology is necessarily following suit. Terms that were vague or ambiguous are being eliminated or redefined. As a result it is now easier for us analytical chemists to say exactly what we mean, and we should make every attempt to do so, especially in formal writing. Nicety in the use of terminology is not just pedantry. If we misuse words, then we run the risk of confusing others and, just as importantly, ourselves.

Unfortunately we are still somewhat lax about terminology. How often do we say .0028... 4 TMC/P AMCID 7 BD5 Tsi,oTge23 Tt0still some

Note – The term accuracy, when applied to a set of test results, involves a combination of random components and a common systematic error or bias component. [ISO 3534: 3.11]

*AMC comment*s
- Accuracy is essentially absence of error. A result of higher accuracy has a smaller error.
- *Accuracy* should not be used in contrast to *precision* – a result is unlikely to be accurate if the results in general are not precise.
- Notice also that, strictly, *accuracy* applies to results and not more general entities such as analytical methods, laboratories or

- ISO 5725 additionally discusses *intermediate measures of precision*, and provides a notation for conditions in which time, calibration, operator and equipment are varied.
- With the help of these specified conditions and some other common terms, it becomes straightforward to describe estimates of precision. Some important examples follow.

Repeatability Precision estimated under repeatability conditions. [ISO 3534: 3.15]

Reproducibility Precision under reproducibility conditions. [ISO 3534: 3.20]

Run-to-run precision