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## INVITED LECTURE - Error, Uncertainty, and Metrology in Nuclear Analytical Methods

*Thursday 20 September 2012 09:00 (20 minutes)*

Nuclear methods have well-established advantages in chemical analysis. Paradoxically, many of these advantages stem from the absence of chemistry in the analytical process. Nuclear reactions are often easier to understand than chemical reactions, and nuclear methods are usually direct, with simple equations relating the laboratory measurements to the sought-for composition. Neutron activation analysis has recently been recognized by the Comité Consultatif pour la Quantité de Matière as a primary ratio method, meaning that its results can be traceable to the fundamental units of the Système International. For this to be practically as well as formally true, an exhaustive search for, and quantification of, sources of bias (errors) and random uncertainty is necessary to describe the metrological traceability of a measurement result. The transparent interweaving of these issues with economics and fitness for purpose is an integral part of analytical research.

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