

## **Measurements of Uranium Isoropic Composition for assessment of Uranium Incorporations**

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### **ABSTRACT**

Internal exposure to uranium can principally be assessed from: external radiation measurements of uranium:: the assay of uranium excreted in urine:: or the assay of uranium excreted in faeces. In most circumstances, measurement of uranium excreted in urine at known times after exposure is potentially the most sensitive method for determining the amount of uranium incorporated. The problems associated with this approach are that natural uranium is always present in urine because of the ingestion of natural uranium in food and drink and that the uncertainties in the intakes as assessed from excretion measurements can be quite large, because many assumptions concerning the exposure characteristics (time pattern of exposure, route of intake, chemical form, solubility, biokinetics within the body) must be made. Consequently, differentiation between uranium that is excreted as a result of dietary intake of natural uranium, and uranium that is excreted as a result of occupational or accidental exposure to enriched/depleted uranium is a significant problem for any measurement technique. The ability to assess contributions from enriched/depleted uranium reliably in a urine sample depends on how precisely and accurately measurements of uranium concentrations and isotope ratios can be made, since enriched/depleted uranium differ in their isotopic composition from natural uranium. Applying currently available methods and instruments for the measurement of uranium and uranium isotopes in urine samples, incorporations of enriched/depleted uranium of levels relevant with respect to potential health hazards can be detected reliably even a long time after exposure.

