# A Novel Method for determination of $^{90}$Sr using Thermal Ionization Mass Spectrometry

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Accurate and rapid determination of $^{90}$Sr in environmental samples is a challenge after Fukushima Dai-ichi Nuclear Power Plant (FDNPP) accident. Measurement of $^{90}$Sr using mass spectrometry instruments is faster than radiometric counting methods.

Thermal ionization mass spectrometry is one of the most reliable techniques for high precision and accurate measurement of stable Sr isotopic ratios. In this work, a new method for $^{90}$Sr analysis will be presented using Isotopx TIMS. Standard Sr solution (NIST-987) with a known concentration of $^{90}$Sr was gravimetrically prepared for $^{90}$Sr/$^{88}$Sr isotopic ratio determination. Abundance sensitivity for $^{90}$Sr/$^{88}$Sr ratio was $2.3\times10^{-10}$. This method is very sensitive for $^{90}$Sr detection and detection limit is about 1 mBk (0.2 fg) and has been measured using Daly ion counting system in combination with Faraday cup detectors. During the $^{90}$Sr measurement, $^{90}$Zr isobaric interference was negligible and extraction chromatography resins (Sr resin) was used for chemical separation. Analytical method of validation was established with wild berry (IRMM-426) and lake sediment (NIST-4354) certified reference materials.