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Rapid determination of Radiostrontium in seawater sample using DGA Resin

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A large amount of radionuclides were dispersed to the environment as a result of the accident at the Fukushima Daiichi Nuclear Power Plant in March 2011. Assessment of Sr-90, one of the major fission products, is crucial from the perspective of its bioavailability depending on behaviour similar to that of Ca, although few reports exist, so far. Traditional analytical procedures applies harmful huming nitric acid or large scale ion chromatography in order to separate between Sr and Ca prior to beta counting. In this study, rapid and robust purification technique for the daughter radionuclides yttrium-90 of Sr-90 using DGA chelating resin (Eichrom) without separation of Sr from Ca. DGA resin shows high distribution coefficient in high hydrochloric and nitric acid concentrations. Furthermore, we optimize the preconcentration method of Sr in seawater.

Keywords: Sr-90, Yttrium, Fuskuhima, Nuclear power plant, seawater