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ORAL PRESENTATION - On the development of a rapid method for the concentration and separation of radiostrontium from water samples based on a new Sr selective resin

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Due to its radiotoxicity there is a strong need for the determination of Sr-90 in environmental samples. One of the main pathways for Sr-90 ingestion is the consumption of water; accordingly the determination of Sr-90 in water samples is of special importance, in routine analysis for environmental monitoring as well as in emergency situations and contamination control. Rapid methods are of high interest in both of these cases, in emergency situations and contamination control, since fast results are needed in order to evaluate a situation thus allowing appropriate measures to be taken, and in routine analysis as they allow fast sample turn-around time and thus high sample throughput.

In order to allow the quantification of Sr-90 by β -spectrometry it is necessary to perform a number of sample preparation steps upfront to the measurement: sample pre-treatment, chemical separation and the preparation of counting samples. Sr-90 is frequently concentrated from water samples using co-precipitation or ion exchange methods both requiring considerable hands-on and overall lab time.

Some results of the development and characterization of a new Sr selective resin, allowing direct concentration and separation of ^{90}Sr from environmental water samples are presented. A number of candidate resins were prepared based on the Sr selective crown-ether di-*t*-butyl dicyclohexyl-18-crown-6 and varying amounts of di(2-ethyl-hexyl)phosphoric acid, selected room temperature ionic liquids (RTILs) respectively. Best suited candidate resins were identified, and further characterised, through batch experiments. Based on obtained results a separation scheme has been developed and optimized, allowing Sr to be successfully separated from synthetic samples.

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