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## On the development of a rapid method for the determination of Pb-210 in water samples based on TK100 Resin

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The crown-ether based SR Resin is frequently used for the separation and determination of Pb-210 in aqueous samples via liquid scintillation (LSC) or gas proportional counting (GPC). The resin only shows significant Pb (and Sr) retention at moderate to high acid concentrations; it does thus not allow for direct loading of Pb from acidified or raw water samples, making the additional use of pre-concentration steps such as ion exchange or co-precipitation necessary.

In order to simplify and quicken the Pb-210 determination an extraction chromatographic resin (TK100 Resin) allowing the direct load of Pb from water samples and its subsequent purification on the same resin has been developed and characterized.

The TK100 Resin is based on the crown-ether also used in the SR Resin; accordingly its selectivity and robustness against interferences from common matrix elements, such as e.g. Ca and Mg, are similar to that of the SR Resin. However, by including HDEHP into its composition Pb can now be extracted at a much wider range of pH conditions, i.e. pH 8. Conditions allowing the removal of other beta emitters (e.g. Sr-90, Bi-210, Y-90) from the resin, and for the final elution of Pb from the resin, have been identified.

Elution studies have been performed with the resin in column form as well as in disc form, the latter having the advantage of allowing higher flow rates. It could be shown that Pb uptake was very high even at elevated flow rates (e.g. 10 mL/min for columns and 30 mL/min for discs).

The new rapid method was tested on spiked tap water samples. Samples of up to 5 L were directly loaded onto the resin in column or filter geometry at elevated flow rates; Pb was retained on the resin, purified and finally eluted with high chemical yield and purity.

The direct measurement of Pb-210 loaded discs by liquid scintillation counting is being evaluated in order to further speed up the method.

**Primary authors:** Ms DIRKS, Carina (Radiochemistry, Department of Chemistry, Philipps-University Marburg); Mr SURMAN, Jake (Lancaster Environmental Center, Lancaster University)

**Co-authors:** Dr PATES, Jackie (Lancaster Environmental Center, Lancaster University); Dr HAPPEL, Steffen (TrisKem International)

**Presenter:** Dr HAPPEL, Steffen (TrisKem International)

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