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Title

A Rapid Determination of Ra-226 and Ra-224 via Alpha Spectrometry using Extraction Chromatography.

Abstract

Alpha emitting radium isotope measurements in drinking waters have become very important in recent times. With traditional methods used currently in laboratories for Ra-226 and Ra-224 require a long ingrowth period and lengthy chemical separations. In EPA method 903.1 for Ra-226, it involves coprecipitation with barium sulfate followed by a purification step. Rn-222 daughter of Ra-226 is then allowed to ingrow for several days and finally measured by radon emanation technique.

Also with current methods, the short-lived Ra-224 measurements go unreported due to the long ingrowth periods involved in the technique. In order to measure the short-lived Ra-224 and long lived Ra-226 as rapidly as possible; a method was developed using a combination of ion exchange resin and extraction chromatography with measurement by alpha spectrometry.

Radium isotopes were preconcentrated from water samples using cation exchange resin; radium was then separated from other interfering isotopes using Eichrom Ln Resin. Ba-133 was used a tracer and measured by gamma counter. After the separation of radium, it was co-precipitated with barium sulfate (Sill 1987) and counted by alpha spectrometry (figure 1). Average Ra-226 recoveries in DI water were 85%. This presentation will describe the time saving technique along with its test results for other water matrices.

