RADIOCHEMICAL DETERMINATION OF CESIUM IN SEAWATER

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ABSTRACT

The purpose of this work is to establish a radiochemical procedure to determine Cs-137 in seawater. This radionuclide is of great significance from the point of view of environmental impact.

The determination of cesium presents serious difficulties because of its low level concentration and the limit established by counting equipment. Thus, it is necessary to preconcentrate cesium from large volumes of water before its determination, followed by the purification from the interfering elements.

In this work, seawater samples were collected from the Atlantic Ocean, in the vicinity of Ubatuba (São Paulo State-Brazil), acidified to pH 1 and stored in polyethylene containers. Cesium was precipitated with ammonium phosphomolybdate (AMP), synthesized in our laboratory. The elements potassium and rubidium present in the seawater are also coprecipitated by AMP and adequate decontamination of the cesium is made by preparing a column by mixing Cs-137 AMP precipitate and asbestos. The interferent elements were eluted with 1.0M ammonium nitrate solution whereas cesium was eluted with 1.0M sodium hydroxide solution.

For counting, cesium was reprecipitated by acidifying the solution with concentrated hydrocloric acid. The overall chemical yield of cesium was of 75%.

Tema: Radioquímica

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