Determination of ^{89}Sr and ^{90}Sr in Milk, Soil, and Biota Using an Extraction Chromatography Column: Further Results

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The method for radiostrontium analysis which was presented at the two previous Bioassay Conferences has been further developed to determine sample sizes, detection limits, and operating conditions. Following sample preparation and initial precipitations, strontium is isolated by absorption on an extraction chromatography column containing 3 grams of crown ether material. The purified strontium is eluted from the column, then allowed to stand for 5 days or more for ingrowth of ^{90}Y. Strontium and yttrium are then separately precipitated and counted on low-level beta detectors.

In the analysis of soil and biota samples, interference from natural uranium and thorium series nuclides has been found under a variety of load and rinse conditions of the extraction chromatography column. These interferences can be removed by performing an iron scavenge prior to loading the column. By including an iron scavenge, the extraction column can be used to analyze 10 successive samples without cross-contamination and without false positive radiostrontium results.

Decontamination factors for calcium have been measured under conditions used in the analysis. The effect of calcium transmission on the accuracy of environmental analyses has been evaluated.

Examples of radiostrontium analyses in various sample types are used to illustrate accuracy of the method. The biasing effect of native stable strontium in environmental samples is illustrated. Options for correcting this bias are discussed.