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Determination of radiostrontium in food and water samples using fuming nitric acid

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The objective of this work was the determination of radiostrontium content in selected food and tap water samples collected within environmental monitoring programme of Federation of Bosnia and Herzegovina. It included food samples of vegetables, fruit, meat, cereal, milk and milk products. The radiostrontium content in environmental samples was determined by the fuming nitric acid method. This classic way of analyzing radiostrontium makes use of the low solubility of $\text{Sr}(\text{NO}_3)_2$ in fuming nitric acid solutions. The procedure included successive precipitation of $^{89/90}\text{Sr}$ as nitrate several times to achieve a good separation from most elements, especially Ca. Chromate precipitations were performed to eliminate Ba, Ra and Pb, followed by hydroxide precipitations to eliminate traces of Y. Counting sources were prepared by weighing SrCO_3 on a planchette and measured on a low background proportional gas flow β counter. The Sr yield was determined using Sr carrier and it varied between 60-90%. Quality control was ensured through analysis of reference materials, blank determination and background determination. Activity concentration of radiostrontium varied between 0.012 Bq/kg and 0.428 Bq/kg for vegetables samples, 0.007 Bq/kg and 0.257 Bq/kg for fruit samples, 0.0995 Bq/kg and 0.289 Bq/kg for cereal samples, 0.024 Bq/L and 0.113 Bq/L for milk and milk products, below MDA (0.004 Bq/kg) for meat samples and for tap water samples between 0.878 Bq/kg and 3.78 Bq/m³.

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