Analysis of the trace elements in paddy water, irrigation water and rice plants of mountainous region in Fukushima-city (II)

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Abstract

PIXE analytical technique was applied to determine concentration of trace elements in paddy water, irrigation water (pond water and spring water) and leaves of rice plants, collected from May, 2014 to October and from May, 2015 to August, in mountainous region in Fukushima-city. It was also examined that the effects of adding stable isotopes of cesium and rubidium into paddy water on concentrations of trace elements in leaves of rice plants and the transfer factors from paddy soil to rice of radioactive cesium derived from Fukushima Daiichi Nuclear Power Plant accidents in March, 2011. PIXE analytical data for the leaves of rice plants indicated that a major portion of added stable isotope of cesium adsorbed into soil. On the other hand, the transfer factors of radioactive cesium for the unhulled rice cultivated with the water which stable cesium had been added in were much larger than those for cultivated with water in which nothing had been added. This implies that the cesium atoms added were replaced with radioactive cesium atoms in soil.