Geophysical Research Abstracts
Vol. 19, EGU2017-1610, 2017
EGU General Assembly 2017

Iodine distribution in natural waters of different chemical composition in relation to water-bearing soils and rocks and water fractions in areas subjected to radioiodine contamination

Liudmila Kolmykova and Elena Korobova
V.I. Vernadsky Institute, Rus. Ac. of Sci., Geochemical, Moscow, Russian Federation (kmila9999@gmail.com)

Iodine is an essential microelement required for normal functioning of thyroid gland. Natural deficiency of stable iodine is compensated by its active intake by thyroid and provokes its higher irradiation in case of radiation accidents and contamination of the environment by radioiodine isotopes. The bioavailability of both stable and radioactive iodine and the specificity of its uptake by living organisms largely depends on geochemical parameters of the environment related to natural conditions of water migration. The goal of the study was to investigate spatial distribution of iodine in natural water of different chemical composition in relation to typical water-bearing soils and rocks and water fractions in Bryansk areas subjected to radioiodine contamination after the Chernobyl accident and to evaluate contribution of this factor to the occurrence of endemic thyroid diseases among local population inhabiting geochemically different areas of [U+FB02]uvioglacial and loess-like sedimentary rocks. The highest content of iodine (Me=13.3 μg/l) was observed in surface water of landscapes with H-Ca, Ca and H-Ca-Fe classes of water migration. The lowest microelement level (Me=5.25 μg/l) was noted in groundwater of landscapes with H, H-Fe classes of water migration in areas of Paleogene water bearing rocks. Regardless of the type of source and class of water migration up to 90% of the total content of iodide is present in the fraction <0.45 μm (as determined by membrane filtration). Up to 50% of iodine pass to solution containing particles < 0.1 μm and increases up to 80% in absence of roughly dispersed sorbents in this fraction. The surface water in areas of loess-like sedimentary rocks hosts the highest levels of iodine where its associated with calcium mineral aquatic complexes and the suspended particles.
The obtained data is believed to be useful in explanation of mobility and intake of iodine and its radioactive analogues by rural population living in different geochemical conditions and using local drinking waters. The data should be accounted of in planning prophylactics of endemic diseases and counter measures in case of radioiodine fallout.