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Distribution and speciation of iodine in drinking waters from geochemically different areas of Bryansk region contaminated after the Chernobyl accident in relation to health and remediation aspects

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DISTRIBUTION AND SPECIATION OF IODINE IN DRINKING WATERS FROM  
GEOCHEMICALLY DIFFERENT AREAS OF BRYANSK REGION CONTAMINATED  
AFTER THE CHERNOBYL ACCIDENT IN RELATION TO HEALTH AND  
REMEDICATION ASPECTS

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**Abstract**

Chemical composition of drinking water from different sources was studied in private farms distributed in areas of the Bryansk region contaminated by radionuclides after the Chernobyl accident. Concentration of major ions showed clear relation to water-bearing rocks and local anthropogenic contamination (e.g. N, P). Drinking water was in general impoverished in I (Me=5,76 µg/l that is below the lower limit of sanitary standard equal to 10 µg/l). Thermodynamic modeling based on chemical composition of the samples showed that the predominant form of iodine is iodide and it forms mineral complexes  $\text{CaI}^+$ ,  $\text{CaI}_2$ ,  $\text{MgI}^+$ ,  $\text{MgI}_2$ , etc. that explains iodine concentration on carbonate barrier in soils and rocks. Complexes' formation may have contributed to radioiodine retention in water during its fallout with further natural decontamination of aqueous phase during water filtration through soils and sediments enriched in carbonates and organic matter. Comparison with distribution of thyroid cancer cases among rural population revealed a tendency of the inverse relation between the number of cases and iodine content in dug well waters; the finding needs further investigation.

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