

MIGRATION OF THE CHERNOBYL NUCLIDES IN SOILS OF BELARUS: FIELD INVESTIGATIONS AND MODELING

KAGAN, L.M. The Institute for Problems of Natural Resources Use and Ecology,
Minsk, Republic of Belarus

Belarus is one of the countries most suffered from the Chernobyl accident when multiple artificial radionuclides were fallen out on soil and involved in various migration processes. Systematic field investigations involving geochemical landscape studying, sample collection and dose rate measurements were carried out and a large database was formed. Test areas are situated in all four radiogeochemical regions of Belarus which differ in the contamination level and natural features: relief type, soil type, vegetation cover. Some regular features of the nuclide migration in soil and dose rate variation in air have been revealed and are discussed. The dose rates had fallen off from their peak values observed in the first month after the accident and stabilized since 1991. Cs-137 is still fixed in the upper 10-15 cm of soil. However, Sr-90 has a pronounced tendency for a higher migration rate, especially at floodplain sites. A model of the radiation situation assessment has been elaborated that is based on: regression relationships found as a result of mathematical processing of the experimental data; theoretical considerations of interactions of photon radiation with material; and a formalized description of the landscape situation. A good enough agreement between the experimental and calculation data (dose rates in air; nuclide inventories and vertical distributions in soil) has been obtained.