



Xe radionuclides monitoring in Northwest region of Russia

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Monitoring of Xe and Kr radionuclides is realized since August 2006 till the present day within the frameworks of ISTC Project #2133. Cherepovets city in Vologda Province and St.-Petersburg were chosen as monitoring points. In Cherepovets site Kr-Xe concentrate samples are taken obtained as product of processing of several thousand m³ of atmospheric air. The delivered mixture is subjected in our laboratory to separation into xenon and krypton fractions. Xenon fraction is adsorbed on charcoal within the ampoule, which is measured subsequently in the well of HPGe gamma detector. The volume of xenon in such ampoule varies from 80 to 160 cm³ under STP that is an equivalent of approximately 900 -1800 m³ atmospheric air, as respects. Minimal detection concentration (MDC) of ¹³³Xe for this technique equals to 0.008 mBq/m³, and this technique has highest sensitivity now.

¹³³Xe concentration was varied in the period of monitoring within the range from 0.09 to 2.5 mBq/m³. Median value for this observation series is 0.68 mBq/m³, and average value was 0.78 ± 0.46 mBq/m³.

Monitoring of xenon radionuclides in St.-Petersburg started since January 2007. For this purpose there are used the samples of liquid technical oxygen, enriched with krypton and xenon. The volume of xenon fraction separated is an equivalent of 25-70 m³ air. MDC for this technique reaches 0.2 - 0.3 mBq/m³. ¹³³Xe concentration of varied for the past period within the range of 0.2 -185 mBq/m³; in ~20% cases there was also registered ¹³⁵Xe. Activity ratio ¹³⁵Xe/¹³³Xe varied within the range of 0.041-0.36. Average ¹³³Xe concentration value in this observation period made up 22.3 ± 42.4

mBq/m³, and median's value was 2.8 mBq/m³. There were calculated 2-3 days backward trajectories for each sampling procedure moment.