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Tritium in the rainwater around the nuclear power plant of Paks, Hungary

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Tritium in the environment has natural and artificial sources. The formers are the nuclear reactions in the upper troposphere and the lower stratosphere, the latter are the various nuclear facilities (fission and fusion reactors, etc.). In order to investigate the two phenomena separately it is necessary to know the effect of artificial tritium emitters to their surroundings with respect to distance from the source.

In the presented study rainwater was collected around the nuclear power plant of Paks, Hungary, by means of special rainwater collectors. The sampling distances were 400 and 800 m from the centre of the plant. The samples were analyzed for tritium with liquid scintillation counting and some samples with the ^3He ingrowth method.

Results show that the trace of the tritium plume from the plant is clearly detectable in the rainwater. However the maximum activity of the rainwater is only around 10 and 5 Bq/l at 400 and 800 m distances, respectively. A Gaussian plume model is fitted to the measured tritium and meteorological data and shows that the influence of the plant on the tritium in rainwater is completely negligible over some kilometers distance.

Primary authors: Dr PALCSU, László (MTA ATOMKI); Mr KÖLLŐ, Zoltán (MTA ATOMKI); Mr MAJOR, Zoltán (MTA ATOMKI)

Co-authors: Mr MANGA, László (Paks Nuclear Power Plant Ltd); Mr PAPP, László (MTA ATOMKI); Dr MOLNÁR, Mihály (MTA ATOMKI); Mr DOMBÓVÁRI, Péter (Paks Nuclear Power Plant Ltd); Mr RANGA, Tibor (Paks Nuclear Power Plant Ltd)

Presenter: Mr KÖLLŐ, Zoltán (MTA ATOMKI)

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