

Isotopic Composition of Precipitation in Hungary in the Last Three Years

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Tritium is one of the most commonly applied environmental isotopes in isotope hydrology. It is suitable for calculation of the age or – more exactly - the mean residence time of very young (<10 years) environmental water. Essential input parameter of models used in these calculations is the distribution of the tritium concentration in the precipitation. The aim of this work was to get a time series of the tritium content of precipitation characteristic for Hungary and to identify those factors, which have essential influence on the changes of tritium content.

The rainfall events are continuously sampled in Debrecen, East-Hungary from December 2000. Tritium, deuterium, and oxygen-18 content of the precipitation samples are measured. We have found that the tritium content of the precipitation changed between 4.8 and 18.0 TU in 2001, between 4.4 and 20.3 TU in 2002, and between 3.5 and 19.8 TU in 2003, with an average of 10.4 ± 0.3 TU, 10.7 ± 0.3 TU and 8.7 ± 0.3 TU, respectively. The decreasing in the average tritium concentration of precipitation in 2003 was due to the very wet winter, while the year 2001 and 2002 were quite similar.

In addition to the seasonal effect we demonstrate the effect of temperature, meteorological fronts, and cyclones on the tritium content and delta values of precipitation. On the basis of satellite images (© EUMETSAT 2001-2004) and meteorological data we determine trajectories in order to decide which moisture source brings the water vapour.