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Tracing solid waste leachate in groundwater by 13C

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Tracers should be used to monitor emissions of leachate from landfills, in order to evaluate environmental pollution. We investigated a selection of parameters commonly found in leachate, in addition to isotopic and radioactive tracers, and their efficiency in tracing leachate in the environment, with emphasis on ground water. A detailed study at 6 locations focused on the occurrence of the isotopes 13C and 3H in leachate, surface and ground water, and comparing this to the water balance at the sites. The content of heavy carbon ([U+F064]13C) in leachate varied between 5.5 to 25.5, in ground water between 4.7 (when polluted), and -11.8 (when unpolluted) to -24.2, and in surface water from -13.1 to -19.7. Measurements of tritium did not show any systematic trend in the leachate and ground water samples.
A comparison of the concentrations of tracer compounds, in addition to the radioactive tracers 3H and 13C showed that the latter seems to be the most stable and the factor correlating best with the hydraulic estimates.