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An integrated approach for risk assessment of groundwater contamination using lysimetric studies

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Groundwater is one of the most important water resources which are always impacted by industry, agriculture, mining and other human activities. Risk assessment of groundwater contamination is an effective way to protect groundwater resources. Lack of Knowledge, an inability of measurement or calculation, potential differences between the assessment of some factors and their true value are causing uncertainty in risk assessment. A new advanced technique of lysimeter experiments has been developed which involves systematic methodology to combine both quantitative and qualitative input of risk factors. Lysimeters are designed for scientific studies of the fate and movement of water, pesticides, salts/nutrients, trace elements, heavy metals and various other xenobiotics. Study of phthalate leaching has been carried out to develop the methodology to monitor the fate and mobility of contaminants and also to evaluate solute transport models. It has been observed that continuous phthalate leaching can cause groundwater contamination as it is detected in both leachate and soil samples. The experiments are repeated to understand the reproducibility of the data and most of the lysimeter results were in agreement with previous experiments. Recommendations are made for further optimizing the design of future leaching studies and also to promote this method in regulatory decision making for the protection of groundwater.

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