

## **A review of laboratory and numerical simulations of hydrocarbons migrations in subsurface environments.**

### **ABSTRACT**

The leaking from underground storage and surface spills of various hydrocarbon sources has caused the hazardous subsurface contamination. The toxic compounds of chemicals have made field study infeasible and it has been replaced by laboratory and numerical simulations. This study introduces the methodology for two-dimensional non-aqueous phase liquid experiments with the application of light reflection and light transmission methods associated with image analysis methods. In addition, this study emphasizes the experiments with numerical simulations in which data acquisition is essential for verification and validation of numerical models. The numerical efforts are supported by basic formulation, with existing codes and its application for light hydrocarbon migration simulation. Overall, this study discussed the laboratory works and numerical simulations using current visualization techniques and makes suggestions for future research.

**Keyword:** Non aqueous phase liquid; Multiphase flow; Laboratory; Numerical simulation; Porous media.