



## Mobilization of Hazardous Metal Species During CO<sub>2</sub> Injection and Storage

Raviv Segev (1), Jacob Bear (1), and Jacob Bebsabat (1)

(1) TECHNION-Israel Institute of Technology (cvrbear@tx.technion.ac.il), (2) EWRE

Mobilization of Hazardous Metal Species During CO<sub>2</sub> Injection and Storage

Raviv Segev<sup>1</sup>, Jacob Bear<sup>1</sup>, and Jacob Bensabat<sup>2</sup>

1- Technion-Israel Institute of Technology, Israel.

2- EWRE, Haifa, Israel.

### ABSTRACT

Deep brine-containing confined geological formations serve as target reservoirs for CO<sub>2</sub> sequestration. The solid matrix (rock) comprising the reservoir may contain hazardous components, e.g., metals like As or Pb, in equilibrium with their concentrations in the brine. In particular, Galena and Arsenopyrite soils are the main source of Pb and As in water

When CO<sub>2</sub> is injected into the reservoir, the brine's composition remains unchanged in those portions of the target reservoir which are not invaded by the CO<sub>2</sub> advancing plume. However conditions change once a portion of the reservoir is invaded by the advancing CO<sub>2</sub> plume. Of special interest here is the reduction in the pH level. As a consequence, the concentration of the hazardous species associated with the rock is increased. The CO<sub>2</sub> enriched brine may endanger water bodies which serve as recipient to the brine. Natural faults or pressure produced fractures in the caprock may also serve as conduits to the hazardous species enriched brine, e.g., to overlying aquifer.

This presentation will discuss mathematical models that describe the chemical interaction between the indigenous brine, the injected CO<sub>2</sub> and the host rocks. The possible migration of the hazardous species under various CO<sub>2</sub> storage conditions will be presented