



## **Prevention of sulfide oxidation in sulfide-rich waste rock**

Elsa Nyström (1) and Lena Alakangas (2)

(1) Lulea University of technology (elsa.nystrom@ltu.se), (2) Lulea University of technology (lena.alakangas@ltu.se)

The ability to reduce sulfide oxidation in waste rock after mine closure is a widely researched area, but to reduce and/or inhibit the oxidation during operation is less common. Sulfide-rich (ca 30 % sulfur) waste rock, partially oxidized, was leached during unsaturated laboratory condition. Trace elements such as As and Sb were relatively high in the waste rock while other sulfide-associated elements such as Cu, Pb and Zn were low compared to common sulfide-rich waste rock. Leaching of unsaturated waste rock lowered the pH, from around six down to two, resulting in continuously increasing element concentrations during the leaching period of 272 days. The concentrations of As (65 mg/L), Cu (6.9 mg/L), Sb (1.2 mg/L), Zn (149 mg/L) and S (43 g/L) were strongly elevated at the end of the leaching period. Different alkaline industrial residues such as slag, lime kiln dust and cement kiln dust were added as solid or as liquid to the waste rock in an attempt to inhibit sulfide oxidation through neo-formed phases on sulfide surfaces in order to decrease the mobility of metals and metalloids over longer time scale. This will result in a lower cost and efforts of measures after mine closure. Results from the experiments will be presented.