

Role of secondary sulfate minerals on metal recycling in an abandoned massive sulfide deposit – Kuvarshan, Northeastern Turkey

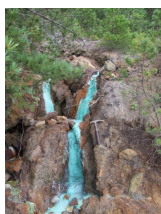
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Formation of secondary sulfate minerals in metal sulphide deposits plays a significant role in sequestration of metals in the surficial environments. This was demonstrated in a historic abandoned copper mine - Kuvarshan, located at the Northeastern of Turkey. Discharges and precipitates formed were sampled seasonally, representing dry and wet periods, and analyzed for chemical composition and mineral contents via ICP-MS, XRF, and XRD studies, respectively.

Results showed that chalcantinite, chalcocyanite, chalcoalumite, jarosite, rozenite, and siderotil were the forms of metal-sulfate salts determined in the precipitates. Forms of sulfate salt and the degree of metal release in the mine discharges, being high in wet period, showed seasonal variation. Formation of sulphate salts governed the recycling of Cu, Fe, and Al in the mine discharges.



a



b



c

Figure 1. Several views from Kuvarshan mine: (a) discharges enriched with sulfate salts (b) precipitation of sulfate minerals (c) acidic pond developed in mine waste