Mineralization properties of Chah Sorb deposit, Central Iran

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The Chah Sorb deposit, located in Yazd Province, Centeral Iran, is hosted mainly by Upper Jurassic carbonate rocks and to a lesser extent by Batonian shale units.

The mineral assemblage may be an important indicator for ore genesis. In the Chah Sorb deposit, the mineral paragenesis can be divided into two stages of varying importance which are generally separated by primary mineralization or alteration attected on primary minerals. The primary mineralization stage is characterized by simple and vein or veinlet sulphides consisting of galena, sphalerite and less than pyrite, chalcopyrite. Most galena and Sphalerite forms open space filling, euhedral to subhedral aggregates up to several centimetrs in diameter. The second mineralization stage is represented by altered minerals especially lead and zinc carbonate minerals and iron oxide and hydroxide minerals. Alteration accompanying the deposition of lead in the host carbonate consists of dolomitization with baroque dolomites that showed low temperature condition of mineralization fluid. The structural control of mineralization is major fault N05°W/85°NE trend.

Mineralization is characterized by persistent lead and zinc up to 34.42% and 14.8% respectively and a consistent association of anomalous silver and cadmium. Copper have low content, about 450 ppm in average, in these deposits.

Simple mineralogy and geochemistry properties, limited alteration, present of baroque dolomite, host rock type, mineralization geometry with geometric relation between mineralization and Jurassic shale unite can be evidence of basin brine fluid affected to sulfide mineralization.

Mass balance of carbon cycling and mineral weathering across a semiarid environmental gradient

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Field Setting and Geochemical Mass Balance

A geochemical mass balance was coupled with radiocarbon and terrestrial cosmogenic nuclide analyses to constrain rates of carbon cycling and mineral weathering across the Sonoran Desert Environmental Gradient (SDEG), a semiarid node of the Critical Zone Exploration Network. Regolith profiles were sampled from stable, upland positions in each of the ecosystems spanning the SDEG. Total elemental analysis of soil, saprolite and rock were used to calculate a geochemical mass balance for each soil profile [1]. Soil carbon mean residence time and soil production rates were determined by radiocarbon analysis of bulk soil samples and ^{10}Be content of saprolite layers, respectively [2, 3].

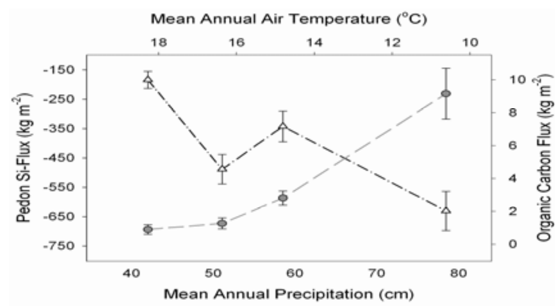

Figure 1: Mass balance of silica (triangle) and organic carbon (circle) relative to climate parameters across the SDEG.

Discussion of Results

Regolith data demonstrated significant variation in the relative importance of organic carbon cycling and mineral weathering with climate. X-ray diffraction indicated weathering reactions dominated by transformation of feldspar to kaolinite. Radiocarbon data indicated rapid turnover of organic carbon, whereas ^{10}Be data indicated moderate rates chemical denudation, suggesting feldspar weathering may dominate atmospheric CO_2 sequestration in these systems.

[1] Anderson *et al.* (2002) *GSA Bulletin* **114**, 1143-1158. [2] Trumbore *et al.* (1996) *Science* **272,** 393-396. [3] Riebe *et al.* (2003) *Geochim. Cosmochim. Acta* **67**, 4411-4427.