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## Observations on trace element hypersaline geochemistry in surficial deposits of evaporation ponds of Exportadora de Sal, Guerrero Negro, Baja California Sur, México

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Trace element concentrations were determined for 28 samples of surficial deposits collected over a salinity gradient of 39‰ to approximately 250‰ in evaporation ponds of a large industrial NaCl production facility located near Guerrero Negro (Peninsula of Baja California, Mexico). Grain size and lithology are used to describe the mixed chemical–detrital material. Major earth and trace elements in the sediments were measured by a combination of an inductively coupled plasma mass spectrometry (ICPMS) for As, Ba, Cd, Cu, Mg, Ni, Pb, U, and Zn, flame atomic absorption spectrophotometry for Al, Fe, and Mn, isotope dilution ICPMS for Hg, and instrumental neutron activation analysis (INAA) for Cs, Ca, Sr, Cr, Sb, and Sc. Changes in grain-size, mineralogy, and chemical composition suggest that suspended particulate matter supplied to the system, mainly by seawater pumped in from the adjacent Ojo de Liebre Lagoon, and to a smaller extent, carried into the ponds by wind from adjacent dunes and by wave-induced erosion of retaining dikes, dominates the sediment in the first two concentration ponds. Freshly deposited fine sediments in these ponds are enriched in organic matter, biogenic carbonates, Al, Fe, Mn, and most of the trace elements, and are similar to surface sediments of the adjacent lagoon. In ponds 3 and 4, intensive evaporation-induced precipitation of calcium and magnesium carbonates occurs causing scavenging of Al, Fe, Mn carried by colloidal particles. The sediment in ponds 4 and 5 includes a thick microbial mat layer, which is enriched in organic carbon, and the accumulation of As and Cd is observed there. In ponds 7 through 11, the deposits generally are low in organic matter and trace elements (except for Sb) and are formed by intensive gypsum and anhydrite precipitation, with an admixture of terrigenous material in ponds 8–10 supplied by a dyke erosion or carried in with wind from adjacent sand dunes.

Palabras clave: Geochemistry of hypersaline environments, Trace elements, Baja California Peninsula, Guerrero Negro salt works

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