Clay Minerals of Lake Abert, an Alkaline, Saline Lake

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Abstract: Mineralogical and chemical analyses of fine clay fractions from in and around Lake Abert, Lake County, Oregon, show that the pyroclastic rocks supplying detritus to the lake weather to a suite of layer silicate clay minerals varying from high-charge dioctahedral montmorillonite to montmorillonite/intergrade smectite-chlorite interstratifications. In the lake these clays extract K, Mg, and Si to form authigenic interstratified illite and a trioctahedral, Mg-rich mineral resembling stevensite in composition. Both the neoformed interstratifications contribute little unambiguously to X-ray powder diffraction patterns, which are dominated by the reflections of detrital clays. From limited data it appears that the illite occurs below 0.8 m depth in sediments of a possibly somewhat fresher (brackish) lake and the trioctahedral interstratification between 0.4 and 0.2 m depth in sediments of a lake of about the same size and salinity (about 30 – 90 g/kg) as that of the present take.

Key Words: Chemical analysis • Chlorite • Illite • Interstratification • Montmorillonite • Saline lake • Stevensite • X-ray powder diffraction

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