structural studies list room-temperature M-site occupancies. In results Simon A.T. Redfern, crystal and is related to the temperature at which the M1:M2 quenchable and only observable by high-temperature in-situ study. occupancies olivines using data culled from the literature, where previous order/disorder in olivine. We find that M-site order/disorder geospeedometer, since it depends only on the cooling rate of the its structure refinements of the high-temperature neutron diffraction data reveal that the amount of Mn in M2 increases (approaching of BiistoL equilibrium Mn-OLIVINES BY IN-SITU NEUTRON and then decreases along its equilibrium value) on increasing temperature to around 50%.

The nonconvergent order/disorder behavior over M1 and M2 sites has been determined as a function of temperature for 50:50 (Mg:Mn) and (Fe:Mn) olivines between 293 and 1273 K. Rietveld structure refinements of the high-temperature neutron diffraction data reveal that the amount of Mn in M2 increases (approaching its equilibrium value) on increasing temperature to around 770 K, and then decreases along its equilibrium path towards 50%. These data are interpreted within a Landau model for non-convergent order/disorder in olivine. We find that M-site order/disorder is non-quenchable and only observable by high-temperature in-situ study. The room temperature site occupancy can be used as a geospeedometer, since it depends only on the cooling rate of the crystal and is related to the temperature at which the M1:M2 occupations depart from equilibrium on cooling. The activation energy for Fe:Mn exchange is calculated as some 193 kJ/mol. The results are used to infer cooling rates of natural and synthetic Mn-olivines using data culled from the literature, where previous structural studies list room-temperature M-site occupancies.

Materials and Methods. Three soil samples from lacustrine sites Xochimilco with different pHs (acid, neutral and alkaline) were separated in particle sizes in order to investigate the clay fraction (with and without organic matter) and the organic fractions HA, FA. All samples were characterised with X ray diffraction (XRD), infrared spectroscopy (IR), microsonde, atomic plasma spectrochemical analysis, transmission electron microscopy (TEM), and scanning electron microscopy (SEM).

Results and Discussion. Clay-OM complexes (with and without organic matter), HA and FA originated of samples from the soils pH alkaline and acid showed differences defined by IR spectra, TEM, SEM and the total metal contents. The OM did not show any difference in pHs acid and neutral. The values δ/N of XRD, TEM, SEM and IR indicated presence for the following crystalline minerals: feldspars, quartz, micas, pyroxenes, smectites, halloysite, amphiboles, allophane and cristobalite.

References:

ORGANOINERAL COMPLEXES IN LACUSTRINE SOILS FROM XOCHEMLCO (MEXICO). Amada Laura Reyes Ortigoza1, Nicolas Aguilera Herrera1, Norma García Calderón1, Jaqueline Caffetas Ortega2, Facultad de Ciencias, Instituto de Física, Universidad Nacional Autónoma de México

Introduction. The most important organoaminerals (OM) in soils have a union between simple or complex minerals (clays) and organic material as humic acids (HA), fulvic acids (FA). The stability of OM complexes and its resistance to degradation give a wide utility in vegetal nutrition. These complexes establish the modern organic agriculture in high productivity groups.(1). This investigation in order to characterise some OM crystals in soils.