Mineralogical and petrological analyses of three chondrite meteorites recovered from the Istfane strewnfield (Morocco)

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Istfane is a strewnfield, 20 km to the west of Tinghir in the south-eastern of Morocco. During the last decade many meteorites were found here [1]. Three other new samples (Istfane 5, 6 and 7) were found during the geological field work in the same area in December 2009. The Istfane meteorites have been defined as L and H-groupe chondrites [2]. XRF analysis, has permitted to define the content (wt%) of major elements (Si, Ti, Al, Fe, Mn, Mg, Ca, Na, K, P) and the concentration (ppm) of trace elements (Ba, Ce, Co, Cr, La, Nb, Ni, Pb, Rb, Sr, Th, V, Y, Zn, Zr, Cu, Ga, Nd, S, Sc). Mineralogical compositions has been determined by SEM analysis using a Zeiss EVO 40 with EDAX analyser that can operate in a extended Variable Pressure (SEM XVP) and through electron microprobe analysis. Strong structural and compositional differences in the three samples of meteorites can suggest that they are not related to a single event. Particular attention has been paid to analysis of metallic phases, their relationship with silicate phases and their different degree of crystallization. All samples has been defined as ordinary chondrites: Istifane 5 shows megacrysts which include small chondrules and a strong alteration; Istifane 6 have very abundant barred olivine chondrule (BO) with glassy mesostasis (last formed interstitial material, usually glass); Istifane 7 is very rich in metallic phase and shows a cryptocrystalline (C) chondrules that often show extinction domains.

[1] El Mansouri *et al*. (2006) *Meteoritics & Planetary Sc*. **41**, A205. [2] Ibhi *et al*. (2007) *Meteoritics & Planetary Sc. Supplement* **42**, 5029.

Sorption of Co, Ni, Cu, Cd and Pb on Na-montmorillonite: A laboratory and modeling study

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One important control on the fate and mobility of trace metals is their interaction with soil and sediment constituents, especially clay minerals. Therefore, in this study sorption of Cu, Pb, Ni, Co, Cd on Wyoming Na-Montmorillonite (SWY-2) is investigated as a function of pH, ionic strength and sorbate/sorbent ratio. For each experiment, 0.5 g/l of montmorillonite is added to a mixture of $NaNO_3$ (0.001 to 0.1 M) and metal ($5\cdot10^{-7}$ to $5\cdot10^{-5}$ M). After initial equilibration for 24 hrs under atmospheric conditions, the pH is titrated from ~3 to 10 with aliquots taken at ~0.3 to 0.5 pH intervals. Each aliquot is further equilibrated for 24 hrs, the pH remeasured, and then the samples are centrifuged, filtered and the supernatant analyzed for metal concentration via ICP-OES.

Sorption increases from low to high pH. The pH_{50} generally decreases in the order $Cd \approx Co > Ni > Pb \approx Cu$, ranging from ~3 for all metals in 0.001 M $NaNO_3$ to 8.9 for Cd in 0.01 M $NaNO_3$. For a given cation, the percent adsorbed increases strongly with decreasing ionic strength and decreasing sorbate/sorbent ratio. Optimized stability constants are derived for each adsorption edge using the FITEQL software with the double layer surface complexation model and assuming that metals bind to both a variable charge edge site and a permanent charge face site. Several stoichiometries (e. g bidentate or monodentate complexes on the variable charge site) are tested for each metal and good fits could be achieved for individual edges. However, median stability constants tended to overpredict the edges at low ionic strength and to underpredict them at high ionic strength.