LA-ICPMS TRACE ELEMENT COMPOSITION OF METAL AND SULPHIDE IN 3 ORDINARY CHONDRITE FALLS.

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Introduction: Trace element compositions are a particularly powerful tool for the study of geochemical processes. Indeed, variations of compositions can span several orders of magnitude [1] and the elements themselves have a wide range of condensation temperatures and geochemical behaviors [2]. Chondrites show different trace elements depletion patterns; their cause is still subject to debate [2, 3, 4]. Some elemental concentrations might vary with petrological type, this would mean that the trace element composition is also influenced by metamorphism [4, 5, 6]. We hope to contribute to these debates by using LA-ICPMS to provide quantitative trace element abundances for chondritic metal and sulphide. Our first test samples were 3 equilibrated ordinary chondrite falls: Butsura (H6), Ogi (H6) and Mezo-Madaras (L6 fragment of L3.7-6 breccia).

Method: *In-situ* trace elements measurements have been performed using the LA-ICPMS at the Open University with LA-SER settings of 80 ⌠m spot size, 10 passes 5 ⌠m deep on each point and a 180 to 200 sec wash-out time between points. Furthermore, Fe, Ni and Co concentrations have been measured by Electron Micropobe at the Natural History Museum and Fe concentration used as an internal standard for LA-ICPMS measurements. The CI composition and volatility sequence used for interpreting the trace elements data is from [7].

Results and discussion: Average Co concentration in kamacite are 5.0±0.2 mg/g in Butsura, 5.0±0.8 mg/g in Ogi and 8.4±0.2 mg/g in Mezo-Madaras, which is consistent with the litterature [8, 9, 10]. 19 trace elements were above detection limits in metal and sulfide grains: 4 moderately volatile/normally depleted elements (Cu, Ag, Ga, Ge) [3, 4] and 15 more refractory elements (Re, Os, W, Ir, Mo, Ru, V, Pt, Rh, Pd, Cr, P, Mn, As and Au). Individual metal and sulphide grains show a depletion pattern when elements are ordered in a volatility sequence. Individual kamacite grains show a similar pattern while variations in the Ni-rich metal trace element composition seems correlated to the difference in Ni concentration. Sulphide composition is the most widespread - it could be caused by matrix effects related to the choice of standard. We will also discuss the effect of proximity to the fusion crust on trace elements results.

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