

Distribution of S, Se and Te in chondrites determined by LA-ICP-MS using a nanoparticle standard

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In situ LA-ICP-MS analysis of S, Se and Te in components of chondritic meteorites provide clues to the formation of chondritic meteorites (Funk et al., *this meeting*).

Femtosecond laser ablation is used as it offers reduced fractionation of volatile elements during sampling [1]. Since the small scale heterogeneity of chondritic matter limits the use of internal standardization for the correction of ablation yields, standardization to the sum of major element compounds was applied. This requires the quantification of all major elements with reasonable precision and ideally a reference material with roughly chondritic major element composition. For this purpose, a chondrite analog nanoparticle standard (CANS) was produced by flame spray synthesis [2] [3]. We aimed at a calibration material with all major and minor elements from Na to Zn (except K and V) and Se and Te in roughly CI chondritic proportions. The composition of CANS was determined by matrix matched SF-ICP-MS and OES, Q-ICP-MS, INAA, XRF and EMP. Sulfur, Se and Te abundances were additionally determined by isotope dilution analysis. Karl-Fischer titration revealed a water content of 6.7 % (m/m). The composition of CANS is roughly chondritic, except that 90% of the S was lost in the production process. The homogeneity of a CANS powder tablet was observed to be comparable to that of NIST SRM 6xx glasses. As a test sample, another powder tablet was prepared from a carbonaceous chondrite [c.f. 4]. The major and trace element composition was determined by various methods and compared with results obtained by LA-ICP-MS using different methods for quantification. With this preparation approach we can demonstrate that matrix-matched calibration standards can be prepared and improve the accuracy of LA-ICP-MS analysis of chondritic materials.

[1] Koch et al. (2006) *JAAS* **21**, 932-940; [2] Athanassiou et al. (2010) *AS&T* **44**, 161-172; [3] Tabersky (2014) *JAAS* **29**, 955-962; [4] Garbe-Schönberg & Müller (2014) *JAAS* **29**, 990-1000.