



The composition and homogeneity of the Allende matrix

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The knowledge of the chemical composition of moons, comets, asteroids and other planetary bodies is of particular importance for the investigation of the origin and evolution of the Solar System. High resolution in situ studies on planetary surfaces yields important information on surface heterogeneity, basic grain mineralogy and chemical composition of surface and subsurface. In turn, these data are the basis for our understanding of the physical and chemical processes which led to the formation and evolution of planetary material [Wurz et al., AIP CP114, 2009].

We measured the chemical composition of an Allende sample and derived the mineralogy. Using laser ionisation/ablation mass spectrometry [Riedo et al., JMS 48, 2013; Neuland et al., MST 27, 2016] we measured the composition of solely matrix material of the carbonaceous chondrite with very high spatial resolution on extended areas.

Carbonaceous chondrites are known to preserve closely the bulk composition of the undisturbed solar nebula. Therefore the chemical composition of Allende can offer valuable clues about the formation processes of the first solids in the early Solar System. We present a quantitative study of the chemical composition, mineralogy and homogeneity of the Allende matrix material. Our results indicate a very fast process that made chondrules and matrix material collapse to form the meteorite.