

Structural analysis of metallic iron and iron compounds in meteorite and implications for formation history

Takashi Mikouchi, Department of Earth and Planetary Science, University of Tokyo, Kazuamsa Sugiyama, IMR, Tohoku University

The Almahata Sitta meteorite is the first example of a recovered asteroidal sample that fell to earth after detection still in the orbit (2008TC3 asteroid), and thus is critical to understand the relationship between meteorites and their asteroidal parent bodies. We found iron metal grains (both *bcc* and *fcc*) associated with sulfide, phosphide, carbide, and silicide due to variable Fe-Ni-S-P-C-Si abundances. The presence of these Fe compounds suggests a smelting event within a differentiated asteroid at very early stage of the solar system formation (4.56 billion years ago).

