ALMAHATA SITTA METEORITE FALL – THE VIEW OF MAGNETISM.

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Introduction

The unique Almahata Sitta meteorite (AS, fall oct 7th 2008 in the North Sudan desert) was classified as a polymict ureilite [1]. However, soon it became clear that AS is in some way comparable to the Kaidun meteorite, and its parent body, 2008 TC_3, represents a secondary rubble pile asteroid [2,3,4]. Systematic studies on numerous AS fragments reported the finding of a range of at least five different ureilite lithologies (≥ 5) but also of other meteorite classes such as enstatite (≥ 6-7) and ordinary chondrites (≥ 4), at least one type of carbonaceous chondrite (Bencubbinite CB-a), a unique chondrite not known before, and more recently for the first time a fragment with basaltic petrological signature (most probably representing the first sample of the crust of an ureilite parent body) [5].

Samples and methods

A large set of Almahata Sitta fragments comprising most known lithologies have been investigated in detail within our projects by mineralogical and magnetic means, and by Raman spectroscopy [6,7]. We tried to compare the signatures of the various AS lithology groupes with known and new original data obtained on related meteorites such Novo Urei, Haverö, Jalanash, Kenna, North Haig, Goalpara, NWA 1241 in the case of ureilites. A second important target were the E-chondritic lithologies. We have included a set of EL 6 samples in our studies such as Neuschwanstein (fall, 2002), Eagle or Pillistfer.

Results

In our contribution we will report a compilation of the "view of magnetism" on the Almahata Sitta meteorite based on the results which we have obtained on our AS and related meteorite type materials. For example, the magnetic signature, specifically magnetic susceptibility, of the AS EL5/6 or EL-IMR fragments compare quite well with data obtained on a number of samples of Neuschwanstein (including NSS 1/2/3 main mass data [9]), Eagle or Pillistfer, eventually pointing to launch pairing.

Hopefully, more and additional sample material of the fascinating Almahata Sitta meteorite fall could be made accessible for scientific investigations in near future.

References:

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