

Microstructural Insight into the Impact History of the IAB Parent Body

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The IABs are a rare group of iron meteorites that didn't form by fractional crystallization of liquid Fe-Ni in the core of a differentiated planetesimal. Instead, they are believed to originate from a partially differentiated body disrupted by multiple impacts during its early history [1].

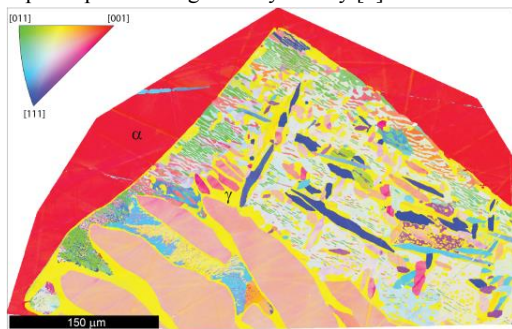


Figure 1: EBSD image of the microstructures present in the Odessa IAB meteorite

We present a microstructural study of the Odessa and Toluca IAB meteorites. Microstructures were analysed using EBSD [2]. Widmanstätten pattern formation appears to have been disrupted by an impact event, forming pearlitic plessite and spheroidized plessite [3]. Evidence for shock and a uniform stress field suggests at least one other impact event influenced the parent body. This occurred after scrambling, and during subsequent slow cooling before break-up of the parent body.

[1] Ruzicka (2014), *Chemie der Erde* 74, 3-48 [2] Morawiec (1997), *Acta Crystallographica* 53, 273-285 [3] Buchwald (1975) *Handbook of Iron Meteorites* 9, 87-113