TRUNCATED HEXA-OCTAHEDRAL MAGNETITE CRYSTALS IN MARTIAN METEORITE ALH84001: *EVIDENCE OF BIOGENIC ACTIVITY ON EARLY MARS*

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The landmark paper by McKay *et al.* [1] cited four lines of evidence associated with the Martian meteorite ALH84001 to support the hypothesis that life existed on Mars approximately 4 Ga ago. Now, more than five years later, attention has focused on the ALH84001 magnetite grains embedded within carbonate globules in the ALH84001 meteorite. We have suggested that up to ~25% of the ALH84001 magnetite crystals are products of biological activity [e.g., 2]. The remaining magnetites lack sufficient characteristics to constrain their origin.

The papers of Thomas Keprta *et al.* were criticized arguing that the three dimensional structure of ALH84001 magnetite crystals can only be unambiguously determined using electron tomographic techniques. Clemett et al. [3] confirmed that magnetites produced by magnetotactic bacteria strain MV-1 display a truncated hexa-octahedral geometry using electron tomography and validated the use of the multi-tilt classical transmission microscopy technique used by [2]. Recently the geometry of the purported martian biogenic magnetites was shown be identical to that for MV-1 magnetites using electron tomography [6].

References: [1] McKay et al. (1996) Science **273**, 924. [2] Thomas-Keprta et al. (2001) Proc. Nat. Acad. Sci. **98**, 2164. [3] Clemett et al. (2002) Am. Mineral. **87**, 1727. [4] Buseck et al. (2001) Proc. Nat. Acad. Sci. **98**, 13490. [5] Thomas-Keprta et al. (2004) LPSC **35**, in press.