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LETTER

Mn-Fe systematics in major planetary body reservoirs in the solar system and the positioning of the Angrite Parent Body: A crystal-chemical perspective

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ABSTRACT

A revised diagram plotting the Fe/Mn ratio of pyroxene and olivine verses the anorthite content of plagioclase indicates that the Angrite Parent Body originated from a solar system reservoir with a similar Mn-Fe signature to that from which the Earth was derived. The major difference in terrestrial and angritic basalts is the extreme volatile depletion (particularly Na and K) in the latter.

Considerable research and publication has been focused on angrite meteorites, which are among the oldest objects in the solar system (~4.56 Ga; Keil 2012). These meteorites include a silica-undersaturated mafic mineral assemblage. The identity and location of their parent body is still unknown and widely debated. Our new work on angrites SAH 99555, LEW 86010, NWA 10463, LEW 87051, and Angra dos Reis focused on olivine and is interpreted in the context of existing pyroxene and plagioclase data sets. This paper improves the "Mn-Fe in olivine and anorthite content of plagioclase tool for planetary parentage" specifically targeted at finding members of the angrite group of meteorites.

Keywords: Angrite, meteorite, planetary parentage, SAH 99555, LEW 86010, LEW 87051, NWA 10463, Angra dos Reis