IS IT POSSIBLE THAT NWA 7325 IS A MERCURIAN METEORITE?

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RESUMO: The origin of a set of achondritic meteorites found in 2012 in Morocco, Western Sahara, is currently a matter of heated debates in the scientific community. The composition and mineralogy of such achondrites do not match any known achondrite group. One of the possibilities is that it has a Mercurian origin, as suggested by data from MESSENGER mission. This possibility arises from compositional similarities between the bulk-composition of Northwest Africa 7325 (NWA 7325), one of the achondritic meteorite found in 2012, and the surface composition of Mercury. High resolution measurements of Mercury’s surface composition with the MESSENGER X-ray spectrometer show that the surface is rich in Mg and S but depleted in Al, Ca, Ti and Fe, which resembles the bulk-composition of NWA 7325. However, its Pb crystallization age of >4.5 Ga argues against its origin in Mercury. On the other hand, simulations indicate a significant relative probability that cumulative particles ejected off Mercury after an impact would reach the Earth within 30 Myr. These simulations show, for instance, that after impact ejection of material at 14km/s, it is possible that ~3% reaches Earth after 10 Myr, ~4% after 20 Myr and ~4.5% after 30 Myr. This probability brings up the question: where are our mercurian meteorites? This study aims to investigate and evaluate if our current knowledge about Mercury indicates it could hold a parental relation to our so-far best mercurian candidate, the NWA 7325 achondrite. We used four main criteria to evaluate this: 1) Likely depth of origin, compositions and mineralogy; 2) Likely location of origin, lithology and age; 3) Probability that it reached Earth; and 4) Isotopic composition. Compiled data from previous studies on both the planet and the meteorite indicate that, despite its old age (>4.5 Ga), it is possible that NWA 7325 could have originated on Mercury. However, the confirmation and the solution to this genetic mystery might only arrive once we obtain in-situ analysis or sampling in Mercury.

PALAVRAS-CHAVE: ACHONDRITE, MERCURY, NWA 7325
TÍTULO (Centralizado, Arial, Negrito, Tamanho 14, Caps Lock)

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(Texto centrado, Fonte: Arial, Itálico, Tamanho: 12)

RESUMO: Folha A4; margens (superior, inferior, direita e esquerda) de 1,5 cm; e espaçamento simples. O texto do resumo deve ter no mínimo 350 e máximo 500 palavras (Fonte: Arial, Regular, Tamanho: 12. Espaçamento: Simples). O resumo deve sumarizar resultados e conclusões. Não serão aceitas figuras, tabelas, fotos, diagramas ou referências bibliográficas mas pode-se utilizar símbolos especiais, fórmulas e equações. O texto deve ter alinhamento justificado. Se tiver dúvida com relação ao número de palavras digitadas selecione o texto e veja o resultado gerado pelo próprio Word. Resumos que não atendam as especificações solicitadas de serão automaticamente recusados.

PALAVRAS-CHAVE: Digite aqui de 2 a 3 palavras chave para seu trabalho, todas maiúsculas.