A propensity for *n*-ω-amino acids in thermally-altered Antarctic meteorites

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Carbonaceous meteorites are known to contain a wealth of indigenous organic molecules, including amino acids, which suggests that these meteorites could have been an important source of prebiotic organic material during the origins of life on Earth and possibly elsewhere. We report the detection of extraterrestrial amino acids in thermally-altered type 3 CV and CO carbonaceous chondrites and ureilites recovered from Antarctica. The amino acid concentrations of the thirteen Antarctic meteorites were generally less abundant than in more amino acid-rich CI, CM, and CR carbonaceous chondrites that experienced much lower temperature aqueous alteration on their parent bodies. In contrast to low-temperature aqueously-altered meteorites that show complete structural diversity in amino acids formed predominantly by Strecker-cyanohydrin synthesis, the thermally-altered meteorites studied here are dominated by small, straight-chain, amine terminal (*n*-ω-amino) amino acids that are not consistent with Strecker formation. The carbon isotopic ratios of two extraterrestrial *n*-ω-amino acids measured in one of the CV chondrites are consistent with ^{13}C-depletions observed previously in hydrocarbons produced by Fischer-Tropsch type reactions. The predominance of *n*-ω-amino acid isomers in thermally-altered meteorites hints at cosmochemical mechanisms for the preferential formation and preservation of a small subset of the possible amino acids.

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