

NOBLE GAS STUDY OF THE FIVE ANTARCTIC CK CHONDRITES

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ABSTRACT

Metamorphosed chondrites are easy to be marked with in-situ noble gas components such as cosmogenic and neutron capture induced noble gas components because of low abundance of trapped component such as Q gas. Noble gases including ⁸¹Kr of CK chondrites EET 13002, 14007, 15156, 15161, 15162, and Karoonda were measured for their CRE ages, size of preatmospheric body, and trapped components. Cosmic-ray exposure ages (CRE ages) of five Antarctic chondrites ranged from 23 - 28 Ma based on cosmogenic ²¹Ne using empirical equation for production rate of cosmogenic nuclide[1], and terrestrial ages from ⁸¹Kr-Kr ages were calculated for the Antarctic meteorites. Neutron capture induced noble gases were clearly observed such as ³⁶Ar, ^{80, 82}Kr, and ^{128, 131}Xe, and size of preatmospheric body of the Antarctic CK chondrites were larger than 47-51 cm based on neutron capture induced ⁸⁰Kr and ⁸²Kr. It is coincide with high shielding condition of the CK chondrites of low cosmogenic ²²Ne/²¹Ne ratios of 1.056-1.070. Trapped components are composed of Earth atmosphere and Q gas from elemental ratios of heavy noble gas ³⁶Ar/¹³²Xe-⁸⁴Kr/¹³²Xe corrected after neutron capture induced ³⁶Ar, and incorporation of HL component with Q gas was verified from Xe isotopes.

[1] Eugster O. (1988) *GCA* 52, 1649-1662.