

U-Pb dating of phosphates in lunar breccia 72235

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Since the 1970's, we have gained tremendous information about the Moon from samples returned by Apollo and Luna missions. In spite of their scientific value, not all of them have been chronologically studied because of analytical difficulty in polymict breccias.

Here, we report that U-Pb dating of lunar breccia 72235, which consist of KREEP basalts, ANTs (highland material; Anorthosites, Norites, and Troctolites), Very-Low-Ti (VLT) basalts, and granites.

The phosphates from VLT basalt clasts yield a Total U-Pb isochron age of 3.96Ga. This VLT age is older than previous reports on VLT (2.9~3.3Ga). These ancient phosphate ages are thought to represent the crystallization ages of parental basalt magma, suggesting that VLT basalt volcanism on the Moon started earlier than 3.96Ga and lasted till 2.9Ga. Also, considering the recent reported ages of lunar basaltic meteorites, there might have been a volcanism concerning all three types of mare basalt (High-Ti, Low-Ti, VLT), simultaneously.

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