**Petrography, Geochemistry, and Age of a Granophyre Clast in the Lunar Meteorite DEW 12007.**

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**Introduction:** Granitic clasts of lunar meteorites are important to reveal a magmatic evolution history of the Moon. Here we present petrographic, geochemical, and geochronological information for a granophyre clast (C3) in the mingled lunar breccia DEW 12007 [1].

**Methods:** A thin section (JK-1) of the DEW 12007 was used for petrography and mineral chemistry with the field-emission electron microprobe JXA-8530F at KOPRI, and zircon age dating with SHRIMP IIe at KBSI. Bulk composition was calculated by a modal recombination method.

**Results:** C3 is an oval-shaped (~4 mm) granitic clast with dense microfractures. It contains bariatic alkali feldspar (An11.3Ab17.4Or41.1, Or46.0-76.2Cn0.4-11.5; ~51 vol %) and plagioclase (An27.0-37Or37.7-1.7; ~3%), intergrown with silica (~40%). “Ternary” feldspar [2] (An11.1-39.0Ab33.6-55.7Or11.6-53.3Cn0.0-2.0) is compact without fractures, contrary to the surrounding plagioclase and alkali feldspar. Olivine is anhedral and chemically homogeneous with Fa19 which is lower than Fa39 of olivines from other lunar granophyres [3, 4]. Minor phases include needle-shaped ilmenite, tranquillityite, RE-merrillite, and apatite, and skeletal zircon. Trilite, baddelyite, and monazite are trace. No pyroxene appears. C3 has a granitic bulk composition, i.e. high SiO₂ (74.01 wt %), K₂O (4.81), Na₂O (1.82), and BaO (1.24; the highest among lunar samples [3]), and low P₂O₅ (0.12), TiO₂ (0.71), FeO (5.57), MgO (0.30), and CaO (0.87). SHRIMP U-Pb isotopic data (n=16) for five zircon grains give the upper intercept age of 4340.2 ± 7.5 (2σ) Ma in a concordia diagram. The weighted mean of ²⁰⁷Pb/²⁰⁶Pb ages is 4332.4 ± 1.6 (2σ) Ma. These ages belong to the oldest ones reported from zircons of lunar granophyres [5].

**Discussion:** Fractional crystallization of a basaltic magma is unlikely to directly produce a granitic residual magma [3, 6]. The bulk composition with high SiO₂ content of C3 is similar to those of experimentally produced silicic immiscible liquids [6]. However, it is not certain that the liquid immiscibility is related to the formation of C3, due to a lack of a high-Fe fraction of immiscible liquids. Granophyric intergrowths, needle-shaped ilmenites and phosphates, and skeletal zircons represent a high degree of undercooling of a granitic magma. Ternary feldspar likely has formed by impact melting of plagioclase and alkali feldspar followed by rapid cooling, on the basis on the compact texture and intermediate composition.