

# Japan Geoscience Union Meeting 2011

(May 22-27 2011 at Makuhari, Chiba, Japan)

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PPS024-23

Room:103

Time:May 23 12:15-12:30

## Occurrence and origin of lunar troctolitic crust

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Lunar feldspathic crust is considered to be a product of a primordial magma ocean crystallization. Mineral distribution in the lunar crust provides us with keys to understand the chemical composition and the mode of crystallization of a lunar magma ocean. Mineralogical studies of feldspathic lunar meteorites show that low-Ca pyroxenes are likely the secondary product after olivine and plagioclase crystallized from a magma. The fact suggests that plagioclase and olivine are the two dominant minerals in the initial crust which formed by a magma ocean crystallization, but low-Ca pyroxene is not a direct product from a magma ocean. If that is a case, a magma ocean composition needs to be more aluminous than that previously estimated by a factor of two or three. Replacement of the primary olivines by low-Ca pyroxenes during the secondary heating events after the magma ocean solidification may have altered an initial abundance of olivine in the primary crust. Lower detectability of olivine than low-Ca pyroxene in the reflectance spectra observation may further bias the real abundance of olivine in the present lunar crust. Here, we discuss an occurrence and origin of the troctolitic crust of the Moon, on the basis of analyses of the Kaguya MI/SP data and mineralogical and spectroscopic analyses of troctolite clasts in the lunar meteorites.

Keywords: Moon, Crust, Troctolite, Magma Ocean