

PPS023-P06

Room:Convention Hall

Time:May 26 16:15-18:45

## Lunar planetary exploration by carbon- and chlorine-bearing materials

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The followings are summary on this project.

- 1) There are many volatile elements such as carbon and chlorine which are remained in the lunar breccias.
- 2) Carbon shows micro- and nano-textures with combined with various cations of Ca, Mg, and Fe in the solid states.
- 3) Chlorine and trace heavy elements are remained in crushed and quenched textures of solid mineral rocks.
- 4) On the surface of the moon without the atmosphere, carbon shows strongly the influences of the solar winds from the Sun and asteroid collisions, as well as planetary impacts.
- 5) A magnetism change is considered originally by state-changes of a carbon-bearing magnetic minerals and the magnetic field of the Moon.
- 6) Carbon is specifically remained in almost all the lunar Apollo impact breccias and also Ca-rich anorthite plagioclases of the lunar highlands and breccias.
- 7) The next exploration of the carbon- and chlorine-bearing materials with volatiles will be significant for the lunar formation analyses.
- 8) On the lunar interior without Earth-type activity, carbon-bearing materials are related with formation of depression hole-structure by gas evaporation after shock wave explosion (with lunar volcanic or moonquake origin).
- 9) The present study technique is used for every global exploration applied for Mars, Asteroids and other planetary probes.

Keywords: lunar exploration, carbon-bearing materials, chlorine-bearing materials, magnetic minerals and magnetism, planetary impacts, solar wind transportation