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Study on impact formation of lunar mineral rocks and interior reservoir of light elements

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The following problems are pointed out on lunar mineral rocks and circulation of light elements:

1) Airless dry Moon has no Earth-type three material states with circulation system.
2) Large chunks of mineral rocks are remained on the Apollo lunar basalt rocks, but Basement rocks with clear gorge features cannot be found so far.
3) Instead of wide crystalline basement rocks in the Earth planet, the lunar surface rocks are porous glassy regolith soils and impact breccias as thick and wide distribution.

The following results can be summarized in this study (Miura, 2012 in press).

1) Present lunar surface is considered to be formed at heterogeneous surface due to little light elements to generate wide atmosphere and ocean water. In fact, pristine Apollo voids- and carbon light elements-rich lunar rocks are obtained by the previous reported data.

2) Those problems on the Moon cannot be explained by the formation model MO of the pristine large lunar basement rocks crashed destroying largely, but can be easily explained by the present impact formation model IE irregular lunar rocks collided and evolved by extra-lunar bodies of the asteroids and water planets with the giant impact. The former model MO has basement rocks remained deeply due to mega-regolith, but close to impossible even by drilled deeply. The latter model IE shows surface material crystallized regolith soils, but the central peaks of impact craters with relatively cooled slowly from glassy regolith soils are not direct deep interior basement rocks lifted largely.

3)Another strong supports to the present irregular impact layering IE are data analytical results of enriched carbon, Ca and rare-earth-elements (REE) especially in impact-related samples of regolith soils and impact-melt breccias (compared with the Mare basalts)(cf. Miura, 2012 in press).

4) Mineral rocks on the airless Moon are impact evolved products with compositional and textural changes to repeat material changes between glasses and crystals due to differences in cooling history at different impact sites. In fact the composition of Ca-rich plagioclases are mixed during formation. Low-temeparture quartz minerals formed at stable magmatic
final-product of terrestrial crust-rocks cannot be found largely on the Moon surface so far.

Keywords: lunar mineral rocks, carbon light elements, interior reservoir, impact evolved formation, porous materials, glassy materials