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Extraterrestrial solidified materials with multi-mixture on the Moon

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The results of the present study are summarized as follows:

1) Study of the Moon provides largely valuable information on formation processes of primordial Earth and extraterrestrial celestial-bodies.

2) Identification of crystalline solids are almost similar between the Moon and Earth, though the Moon rocks might be formed by similar formation processes of terrestrial (Earth) rocks based on the crystalline parts. However, extraterrestrial solids are mixtures of multiple states shown as amorphous solids.

3) Formation of quasi-spherical Moon body formed mainly by impact-related melting process is found as heterogeneous and irregular distribution of lunar rocks with impact craters.

4) Fluid-bearing depositions irregularly distributed on the surface and interior of the Moon are largely based on storages on the interior formed by solidified mixtures of multiple states triggered by impact process on the Moon.

5) Different processes of solids between the Moon and Earth can be observed silica Si-O frameworks which can be obtained by the ion bombardment experiments. Crystalline rocks with hard silicate structures show higher ion-peaks of alkali ions (Na, K and Ca etc.), whereas solid-aggregates of the Moon rocks show higher ion-peaks of Si and Al ions which are easily destroyed by ion bombardment relatively.

6) Ion-peaks by the sputtering of Earth impact-breccias are clearly higher than those of the Moon breccias, which main differences are not rock textures but atomic bonding.

7) The air- and water-less Moon with solidified materials with multi-states is formed from nano-grains to macroscopic rocks by impact-related evolution process.

8) The primordial planet Earth with remained heterogeneous surface by impact-related process is considered to be different cyclic system of three states (air, liquid and solid) with macro-life activity which is formed by huge production from the interior triggered by huge collision process of the giant impact.

Keywords: the Moon, mixture, solidified material, material state, ilicate framework, ion bombarment run