Carbon Contribution of the dark moon samples: Quenched solids of the lunar materials

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The extraterrestrial bodies without the atmosphere (including the Moon) can usually be seen wholly blackish dark color. The lunar black and white surface is explained simply by the differences of colored minerals the albedo by smooth and irregular topographic surface. This explanation can be generally understood by descriptive terminology and formation, but is clearly main reason that it cannot be developed further study and challenges in future. Recently author has analyzed comparatively that based on terrestrial rocks and artificial analyses with carbon contents and micro-textures, the lunar samples of the Apollo (USA) and lunar meteorites (including present analyzed samples) show significant carbon contents and carbon-bearing textures, which indicate large contribution of blackish carbon on the Moon surface.
Difference of rock minerals on the Moon surface, has been explained generally by colored dark minerals of pyroxene, olivine and metallic mineral on the Mare basalt (Earth volcanic type) and the Highland gabbro-to-anorthosite (Earth plutonic type). However, the lunar minerals reveal blackish dark color by limited rock-composition range, which cannot be compared with whitish minerals of silica quartz and various feldspars on the water-planet Earth evolved widely.
The moon minerals which are also observed in two lunar meteorites (NWA4483 and Y-86032) , show comparatively low crystallization, very few kinds of minerals and rocks caused by poor fluids, hydrous mineral, silica-feldspar variety on the Moon surface, which might be lower activity in the Moon.
In the present study, it is resolved finally big differences of carbon contents obtained not only at mineral-rocks on the Mare and the Highlands, but also on regolith soils and breccias.
Earth's rocks are obtained in this study that carbon contents and textures by bulk analyses and SEM observation, are increased on colored minerals and volcanic rocks. It indicates in this study that carbon contents are changed directly by cooling process, which is not simply caused by a depth of unknown Earth's interior explained by descriptive explanation.
It is experimentally confirmed in author's study that a carbon-bearing solids and textures are formed newly by artificial laser experiments reacted as quenching sputtering.
The present results of Moon's color study are summarized as follows.
1) The colors of the Earth's rocks are classified with the silica contents (and feldspar), whereas the lunar rocks can be classified with carbon contents by the different cooling process not mainly by mineral variety.
2) Lunar quenched rocks of regolith soil and breccias have much content of lunar carbon. On the other hand, terrestrial carbon can be obtained relatively in volcanic rocks quenched rapidly.
3) Carbon increases formed by carbon-bearing solids have been obtained by the laser irradiation experiment, which can be confirmed strongly by formation of carbon-bearing materials and textures on the Moon rocks studied in this study..
4) From comparative study of the Moon and water-planet Earth, the isolated Moon body surface shows finally blackish dark color including carbon-bearing local solids and micro-textures formed by quenched processes of brecciated reaction.

Keywords: Blackish dark color of lunar sampes, Carbon content effect, Quenched solids formation

