

Study on New Model of Interior Reservoir of Light Elements on the Moon and Earth-Type Planets

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The following problems are existed interior reservoir and circulation of light elements on the Moon and Earth-type planets (i.e. primordial Earth and water-less planets of Mars and Venus) as follows:

- 1) Few systematic models of light elements and the Solar System materials of the Moon, Earth-type planets and smaller bodies are proposed, but only time and location data of the remained solid rocks are obtained at the primordial to the present bodies.
- 2) Little hard and wide rocks on the water-less Moon are existed except the breccias and fine void-rich regolith soils.
- 3) Light elements on the Moon are lost to form high-temperature minerals and rocks.
- 4) Few models of light elements to penetrate and reserve in the interior against the gravitational forces are proposed on water-less Moon and other planets.

The following models of impact growth process are proposed to explain the above problems (Miura, 2013; in press).

- 1) Impact growth model is applied to remained solid rocks from fine-grains to breccias.
- 2) Wide and hard continental rocks which have been formed by plate-movements, subduction and magmatic melting with lift-up eruption of ocean-planet Earth, cannot be applied for the Moon and other water-less planets.
- 3) The Moon rocks without light elements and high-temperature minerals and rocks are not formed by continuous smaller impacts, but by giant impacts with two planetary bodies with much light contents), called as step 1 process.
- 4) On the later Moon surfaces with mixed with smaller blocks, light elements are penetrated and stored in the interior by later impact, called as step 2 process.

In short, there are major two types light elements of steps 1 and 2 processes on solidified rock and regolith on the Moon. The process of light elements as multi-steps are applied to waterless Venus and Mars.

The present Earth light elements are not used for the Moon and primordial Earth-type planets model, because the Earth is changed so much by ocean water system.

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