

Partitioning of carbon between metallic- and silicate-liquids in magma ocean of differentiated planetesimals

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Partitioning behavior of carbon has not been determined well though it is one of the strong candidates for light element in the earth's core. We investigated partitioning of carbon with sulfur and oxygen between metallic- and silicate liquids at 6 GPa and 2073 K in carbonaceous chondrite composition (Allende meteorite; CV3). High pressure experiments were conducted with multi-anvil high pressure apparatus. Graphite was used as capsule material. Composition of coexisting metallic- and silicate liquids were measured by electron microprobe with wavelength dispersion type spectrometer except for carbon in silicate liquid. To estimate carbon concentration in silicate liquid, carbon concentration of bulk recovered sample was measured by elemental analyzer. Present result suggests that in oxidized carbonaceous chondrite composition, partitioning coefficient of carbon [$D_{\text{Metallicliquid/Silicateliquid}} = C_{\text{Metallicliquid}} / C_{\text{Silicateliquid}}$; C is concentration of carbon in wt.%) is close to 1, and it increases with increasing the $\text{Fe}^{\text{metal}}/\text{Fe}^{\text{oxide}}$ ratio of the bulk carbonaceous chondrite composition.