

The history of various petrologic type clasts in Adzhi-Bogdo regolith breccia meteorite

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The study of regolith breccia meteorites has been progressing by comparison of amount of solar-gas and maturity among dark-light structure to decipher the bombardment history of parent body regolith layer. Rarely existed the regolith breccia meteorite that has various petrologic type clasts provides information about not only bombardment in regolith layer but bombardment that had dug up different origin depth clasts. We study the regolith breccia meteorite that has various petrologic type clasts to decipher the complex history of regolith breccia meteorite that has various petrologic type clasts.

Adzhi-Bogdo LL3-6 chondrite regolith breccia meteorite consists of submm- to cm-sized fragments embedded in fine-grained clastic matrix. It is found two types of clasts in the Adzhi-Bogdo meteorite sample, the light clasts that are main texture of Adzhi-Bogdo meteorite, and the dark clast that is a fragmental breccia clast including more fine-grained clasts and matrix. As a result of analysis, the light clasts are LL chondrite composition, high petrologic type5-6 and S1-2 weakly shocked. On the other hand, dark clast is LL chondrite composition, low petrologic type3 and S3-4 moderately shocked and welding fragmental breccia clast. The light clasts and matrix are immature regolith breccia by the ratio of volume of glassy soil breccias between light clasts and matrix. As a result of analysis of the size distribution, high petrologic type light clasts are larger-grained and worse sorted, and low petrologic type clasts in dark fragmental breccia clast are more fine-grained and better sorted and are more mature.

It is found a positive correlation between the size distribution of clasts and maturity by comparison with regolith breccia meteorite and lunar regolith. More mature regolith is more fine-grained and better sorted. It is suggested the history of different petrologic type clasts of Adzhi-Bogdo meteorite at regolith layer on the parent body; to begin with dark clast that had been shallower depth of the parent body was dug up to regolith layer and welded after progressed to mature regolith, and then light clasts that had been deeper depth of parent body was dug up to regolith layer and consolidated with dark clast at immature regolith.