Chemical characteristics of irghizite: Implications for the nature of the projectile

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Irghizites and zhamanshinites are tektite-like objects and impactites from the Zhamanshin impact crater, respectively. There are obvious chemical differences between irghizites and zhamanshinites. Irghizites have higher Co and Ni abundances than those of zhamanshinites [1]. These enrichements have been considered to be the due to the contamination of extraterrestrail materials [e.g., 1-3]. Based on the chemical compositions, it is likely that chondrite and iron meteorites are candidates of the impactor materials on the Zhamanshin crater [2-4]. However, no clear conclusion regarding the identification of impactor has been made. In this study, we determined the chemical compositions of irghizite, specially focusing on siderphile element in order to identify the meteoritic component.

One irghizite sample was carefully ground in a clean agate mortars. Homogenized powder sample was taken for neutron irradiation for two different periods at Kyoto Univerisity Research Reactor Institute.

Thirty elements were determined in irghizite by using INAA. Our analytical result are in good consistent with those of previous studies [1-4]. Being consistent with the results of the previous studies [1-4], our Ni and Co values are higher than those of zhamanshinites [1,3] and similar to those of mafic materials. We consider a possibility that Cr, Co and Ni abundances for irghizite are controlled by the addition of chondrites or iron meteorites to crustal materials. In plot of Ni vs. Cr, both mixtures with chondrite or iron meteorite could produce Cr and Ni abundances of irghizite. For refined identification, platinum group elements should be determined.

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