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Disentangling impactor type and post-collision processes for Zhamanshin structure

Magna*, T., Žák, K., Pack, A., Moynier, F., Mougél, B., Peters, S., Skála, R., Jonášová, Š., Mizera, J., Randa, Z.
*Czech Geological Survey, Klarov 3, 11821 Prague, Czech Republic, tomas.magna@geology.cz.

Zhamanshin Impact Structure, Kazakhstan, provides an unprecedented look at medium-sized craters which are half-way between larger tektite-producing structures and smaller craters without ample quantities of melted ejecta. A rather steep angle of impact resulted in negligible formation of distal ejecta. Besides, a complex lithological situation gave rise to a wide range of impact-formed materials, from acidic irghizites to basic zhamanshinites. Combined high-precision Cr and triple-oxygen isotope analyses allowed to identify the impactor as rare CI-like chondrite and quantify its proportion at ~2%, consistent with other reports [1,2]. The O isotope systematics indicate prolonged equilibration of irghizites with ambient atmosphere in an impact plume, also evidenced by the presence of oxidized iron on their surfaces while central European tektites lack such signatures do not bear any measurable difference to typical terrestrial values [3].

[1] Jonášová, Š. et al. (2016) GCA 190, 239–264. [2]

Schulz, T. et al. (in press) GCA, doi:

10.1016/j.gca.2019.08.045. [3] Magna, T. et al. (2017)

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