ZHAMANSHINITES AND AOUELLOUL-GLASS: MAIN ELEMENT ANALYSES AND CORRELATIONS. C.Koeberl, Institute for Astronomy,Univ.Vienna, A-1180 Vienna,Austria; and Institute for Astronomy,Univ.Graz, A-8010 Graz, Austria.

The purpose of this abstract is to report shortly some results of analyses performed within the framework of multi-element analyses of tektites and impaktites. Among the samples analyzed, the importance of Zhamanshin data results from the fact that these have been discovered only a short time ago (1) and that the knowledge of chemical abundances in this objects is still very poor. Here we describe some preliminary results of the main element chemistry and correlations between some of them in samples from the Zhamanshin crater and, for comparison, also in samples from the Aouelloul-crater (Mauretania).The impact material occuring at the Zhamanshin-structure near the Aral sea in USSR has been divided in tektite-like material, called Irghizites, and impaktite-like material, called Zhmanshinites, whereas the latter group is subdivided into three classes: silica-rich zhamanshinites (containing about 74% SiO_2), zhamanshinites (containing about 54% SiO_2), and silica-poor zhamanshinites (containing about 40% SiO_2)((2), (3), and (4)). The age of the structure and material has been determined from fission-track data and K/Ar data to be somewhat like $1.07 \cdot 10^6$ years (5),(6), which obviously excludes a correlation with the Australasian tektite strewn field (7). Structural studies (8),(9), and chemical data (10),(11),(12) point strongly to a terrestrial origin of this material. The correlation patterns revealed by the microprobe studies reported here (performed with an automated computer controlled ARL-SEMQ electron microprobe on carbon coated samples) show a clear similarity with other tektite and impaktite material, which is in agreement with extensive trace and subtrace element studies on different materials of this type (12). Four of the correlation diagrams obtained from the microprobe analyses of silica-rich zhamanshinites (sample No. I8201 in the figures) and Aouelloul-glass (sample No. I8205) are depicted on the next page in figures 1 to 4 and stand here representative for similar data (12),(13). From random spot analyses it is evident, that the glass samples are much more variable on a micron scale than the constancy of the bulk analyses (12),(13) would suggest. The negative correlation between SiO_2 and Al_2O_3 (figure 1) and between SiO_2 and CaO is very obvious, while the correlation between SiO_2 and Na_2O and the correlation between SiO_2 and K_2O is not so clear, but indicated. Such correlations also exist for SiO_2 and TiO_2 and SiO_2 and MgO. All other main elements show a negative correlation with SiO_2 (see figures 1 to 4). For Al_2O_3 and TiO_2 a positive correlation exists (12),(13), although the scatter of the data points in larger than in figure 1. The Na_2O/K_2O diagram shows no clear-cut correlation, but a distinct scattering. This all leads to the conclusion, that at least two different minerals must have been present as precursor materials, which is not in contradiction with the geological setting of the crater in different sediment layers (1). The Aouelloul data will be discussed elsewhere (13).

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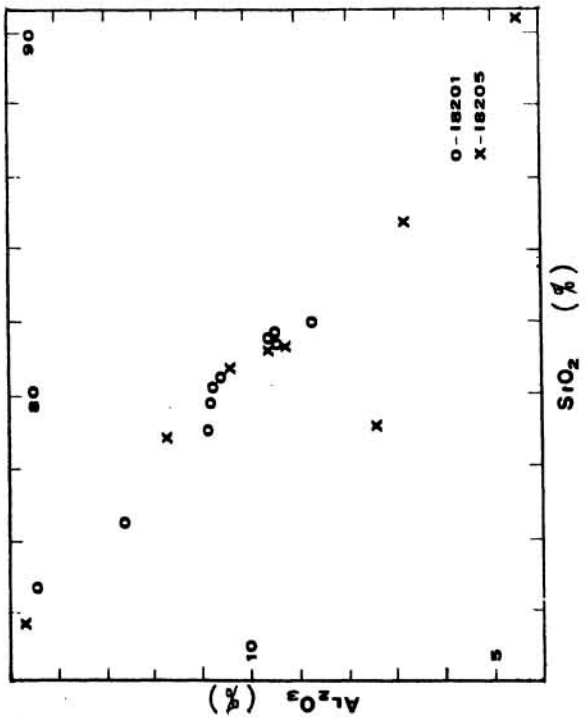

Fig. 1

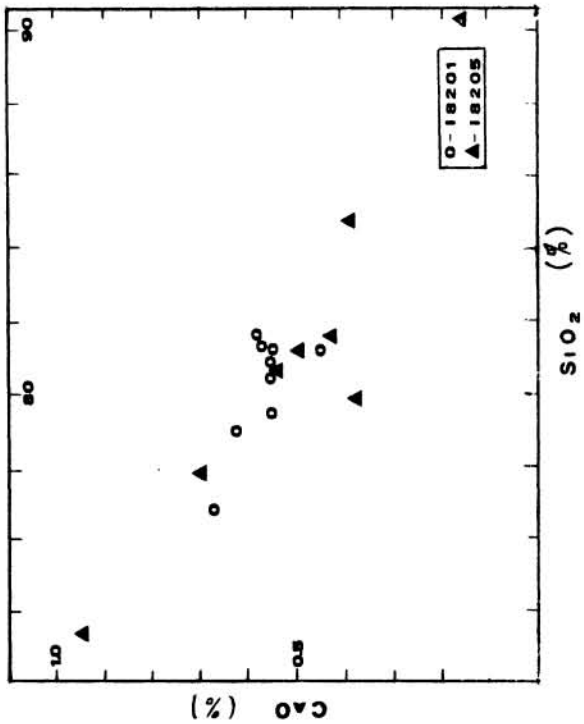

Fig. 2

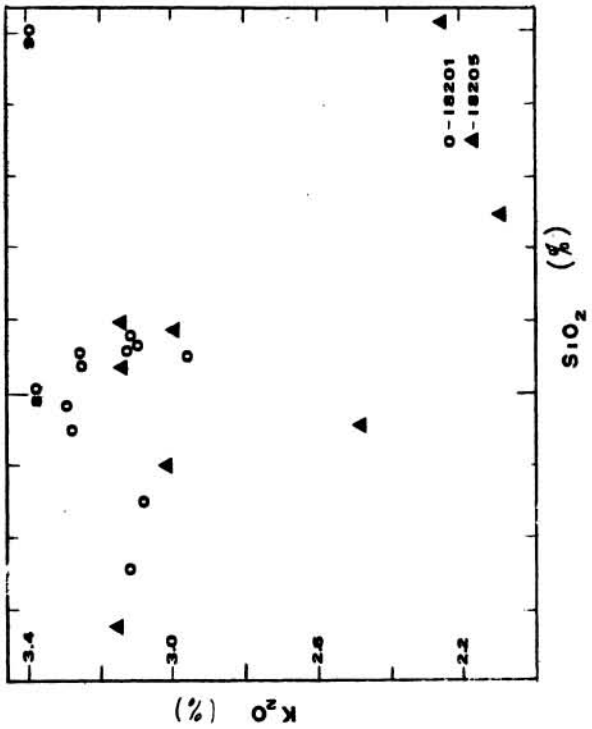

Fig. 3

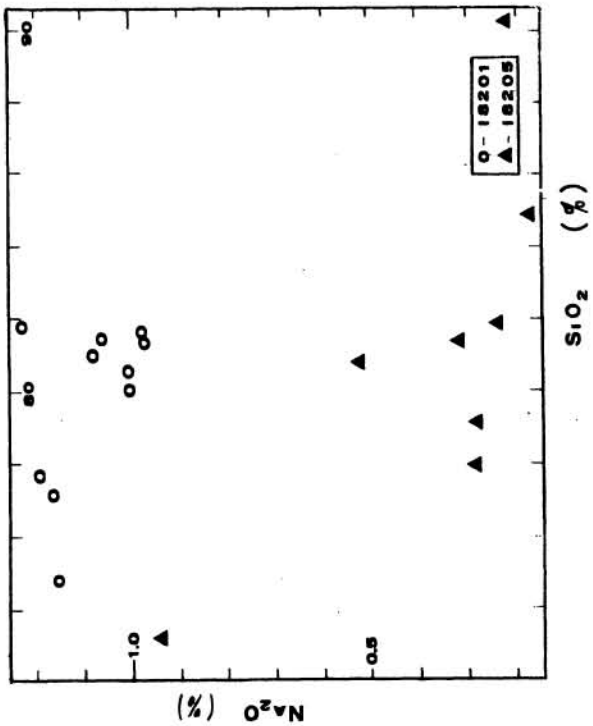

Fig. 4