DEGASSING BEHAVIOR OF IMPACT GLASSES AND TEKTITES. K. Heide, K. Gerth, and Th. Stelzner, Institut für Geowissenschaften, Friedrich-Schiller-Universität Jena, Germany.

Detailed vacuum degassing studies on natural glasses from different terrestrial environments show that the degassing behaviour of natural glasses differs strongly both in respect to their origin as well as from manmade glasses [1,2].

The degassing profiles have been obtained using a thermobalance in combination with a quadrupol mass spectrometer (STA 429 Netzsch and QMG 402 Balzers). From these degassing profiles the natural glasses can be devided into volcanic glasses, impact glasses, tektites including the Libyan Desert glass, and the noncrystalline silica forms like hyalite [3].

As it is known from systematic studies, the degassing behaviour of manmade glasses is determined by the melting temperature and melting atmosphere, by the raw materials and the "fining" agents [4].

In case of the natural glasses the thermal history and the "raw" materials are quite different. The study was focused not only on the water release during heating, but also on the release of other relevant fluids like CO_2, CO, N_2, SO_2 and hydrocarbons.

The vacuum furnace has been tested in respect to the degassing behaviour of the Al_2O_3-crucibles and ceramic furnace tube. The gas release has been monitored in the temperature range from 100°C to 1500°C. The sample size varied from 10 mg to 100 mg. Individual broken pieces were analysed without any handling. The heating rate was 10 K/min.

Tektite samples from Moldavia, Indochina, Libyan Desert glass, impactite from Kasachstan (Irghizite and Zhamanshinite) and Germany (Suevite) have been compared with rhyolithic obsidian glasses and hyalites.

Tektite glasses in a more restricted sense are a special kind of natural glasses in respect to their degassing behaviour. There is just a very weak degassing of CH-species in a temperature range from 900°C up to 1200°C (Fig. 1).

The degassing of impact glasses (Zhamanshinite, Suevite) is more similar to the degassing behaviour of volcanic glasses (Fig. 2). The relation of the starting temperature of bubbling to the melting conditions is an open question at present. With further systematic experimental studies the thermal history of the glasses could be reconstructed from the gas release profiles.

References: [1] Heide K. et al. (1994) *Glastech. Ber. Glass Sci. Technol., 67 C,* 228–232. [2] Heide K. et al. (1997) *J. Thermal Anal., 48,* 73–81. [3] Heide K. (1974) *Chem. Erde, 33,* 195–214. [4] Stelzner Th. and Heide K. (1992) *Glastech. Ber., 65,* 150–156.

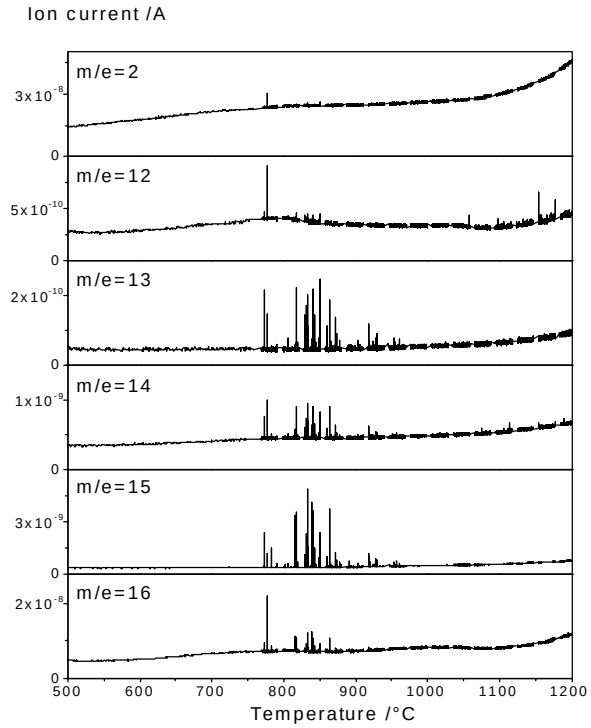

Fig. 1. Degassing profile of a tektite glass (Indochinite) (m/e 2 = H_2, m/e 12 = C, m/e 13, 14, 15 = fragments of CH_4).

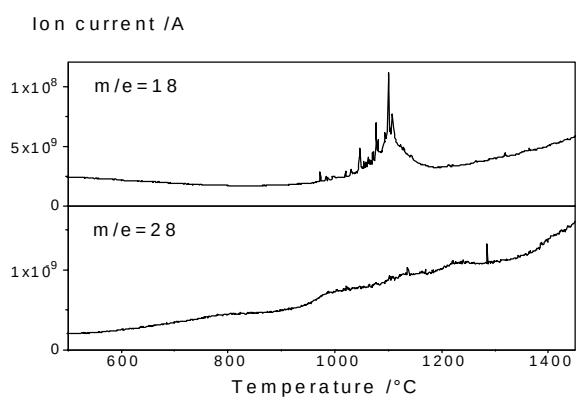

Fig. 2. Gas release profile of an impactite (Zhamanshinite) (m/e 18 = H_2O, m/e 28 = CO).