

VIVIANITE FROM THE ICEMAN OF THE HAUSLABJOCH (TYROL, AUSTRIA): PRELIMINARY RESULTS

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»The discovery in September 1991 of a Late Neolithic man in a glacial field between Austria and Italy offered uniquely preserved archaeological samples (SEIDLER, 1992). Commonly known as the Iceman (or Ötzi, having been found in the Tyrolean Ötztaler Alps), the body is the oldest to be retrieved from an alpine glacier and is one of the best preserved mummified humans ever discovered« (EDWARDS et al., 1996).

An interesting mineralogical detail of the Iceman is the growth of the mineral Vivianite $\text{Fe}_3(\text{PO}_4)_2 \cdot 8\text{H}_2\text{O}$ on the skin in contact with the surrounding weathered rocks (Fig. 1).

Vivianite is not uncommon in connection with mummies from bogs (anaerobic, non-oxidizing conditions); in the case of the Iceman this seems to be the first report of vivianite from mummified humans in glacier environment. The formation conditions of vivianite at this low temperatures is an additionally interesting feature of this finding.

Although there are only very small quantities available (about 5 to 10 mg in strong intergrowth with the underlying skin) some mineralogical-geochemical data could be extracted:

Powder X-ray diffraction shows clearly the strongest reflection of vivianite at 6.78 Å. An ongoing TXRF-study on the sample (trace element analysis of 0.18 mg material !) gives a nearly stoichiometric composition (12.8% P, 27.4% Fe) and 159 ppm Ti, 176 ppm Cr, 299 ppm Mn, 87 ppm Zn and 19 ppm Sr and additionally a series of elements below detection limits; compared with other vivianites (Waldsassen/Germany, Hagedorf/Germany, Luax Mine/Colorado) Mn and Zn-contents of the samples are very low.

Fig.1: Vivianite on skin of the Hauslabjoch-mummy Tyrol (»Ötzi«); length: about 5 mm (picture from Baumgarten, B., Naturmuseum Bozen; see next page).

EDWARDS, H.G.M., WILLIAMS, A. C. & BARRY, B. W.: Humankind: a Fourier transform Raman spectroscopic study of the Iceman (1996): - Spectroscopy Europe, 8/1, 10–18

SEIDLER, H., BERNHARD, M., TESCHLER-NICOLA, M., PLATZER, W., ZUR NEDDEN, D. OBERHAUSER, A. & SJØVOLD, T.(1992): - Science, 258.

