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AN X-RAY ABSORPTION SPECTROSCOPY STUDY AT SULFUR *K*-EDGE OF HAÜYNE FROM SAINT ANTÃO ISLAND (CAPE VERDE)

Figueiredo, M.O.[1], Pereira da Silva, T.[1], Silva, L.C.[2], Mirão, J.[3] & Mendes, M.H.[2]

[1] Cryst. Miner. Centre, IICT, Al. D. Afonso Henriques, 41-4ºesq., 1000-123 Lisboa
[2] Geology Centre, IICT, Al. D. Afonso Henriques 41-4ºdto, 1000-123 Lisboa
[3] Geophysics Centre, Univ. of Évora, Aptd. 92, 7001-019 Évora, Portugal
e-mail: crysmin@clix.pt

Haüyne is an aluminosilicate first described by Brunn-Neergard in 1807 (quoting Dana, 6th ed., p. 431). The crystal structure was determined by MACHATSCHKI (1934) and received the SB symbol $S6_9$. Since then various isotypical minerals were identified, namely sodalite, nosean and lazurite – the latter being sulphur-enriched and used as a natural and valuable blue pigment named ultramarine. The cubic framework of Al and Si tetrahedra forms large cages identical to those found in zeolites, where a large anion (mainly sulphate, but also chlorine) is hosted, surrounded by alkali cations (mainly Na with minor K and Ca).

Despite being known for almost two centuries, haüyne is still nowadays a subject of intense structural and chemical study (TAUSON et al., 1998) and its occurrence in mantle rocks has been reported for the first time only a few years ago (WULFF-PEDERSEN et al., 2000).

Recently, haüyne was identified in tephritic and phonolitic rocks from Santo Antão Island, Cape Verde Arquipelago, and a peculiar microstructure was remarked (SILVA & MENDES, in preparation). A chemical study with synchrotron radiation X-ray fluorescence (SRXRF) was subsequently undertaken using the photon microprobe of the LURE* (line D-15A at DCI), aiming at understanding the chemical variations that could be associated to fluctuations in the bluish colour. A systematic presence of Sr and Mo as trace elements was noticed by SRXRF analysis in all haüyne samples from Santo Antão.

In parallel, an X-ray absorption study at the sulphur K-edge was undertaken at the ESRF* using beam line ID-21 in order to ascertain the speciation state of that element in relation to colouring. XANES spectra clearly denoted the presence of oxidised sulphur in the form of sulphate through the characteristic sharp white line at 2482 eV. *Ab-initio* simulations based on the multiple scattering approximation implemented in the FEFF code (ANKUNDINOV et al., 1998) were carried out to model S *K*-edge XANES spectra. Observed post-edge features and other details are discussed taking into account SRXRF data and theoretical spectra modelling.

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