

## **The origin of S<sup>4+</sup> detected in silicate glasses by XANES**

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### **ABSTRACT**

The origin of sulfite (S<sup>4+</sup>) species in silicate glasses was evaluated using XANES at the S *K*-edge. Systematic investigations show that the presence of S<sup>4+</sup> species in silicate glasses is an analytical artifact related to changes in the sulfur species caused by irradiation with an electron beam during EMPA or by irradiation with an intense focused X-ray beam during synchrotron analysis. The data shown here indicate that S<sup>2-</sup> and S<sup>6+</sup> are the only significant sulfur species occurring in silicate glasses synthesized under geologically relevant conditions.

**Keywords:** XAS (XAFS, XANES), sulfur *K*-edge, glass properties, sulfur oxidation state, beam damage, sulfur speciation