

# **Sulphur solubility in hydrous silicic melts at different oxygen fugacities**

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The solubility of sulphur (S) in felsic silicate melts has implications on the volatile budget of degassing magmas and associated volcanic eruptions. Further, the S content in hydrous magmas controls the formation of magmatic sulfides which are likely to scavenge metals, and thus, control ore formation.

The solubility of sulphur in felsic melts is less well understood than in mafic melts and this study tests the solubility behaviour of S under different oxygen fugacities. We have conducted piston-cylinder experiments using a dacitic melt composition and anhydrite as starting materials. Two different run conditions at 850°C and 2kbrs and 1000°C and 3kbars were applied, respectively. Oxygen fugacity was varied from NNO-1 to NNO+6.5 using different mineral buffers in a double capsule assembly. The inner capsule was loaded with anhydrite followed by the dacite mix and again by anhydrite on top. About 10wt% H<sub>2</sub>O was added and the run duration was 3 to 7 days.

Quenched glasses showed many vesicles in the 850°C and 2kbar runs, indicating the exsolution of a fluid phase, whereas the 1000°C runs showed only small fractures upon quenching. The quenched glasses contain small crystals (plagioclase, pyroxene) and irregular quench structures.

A Cameca SX100 electron microprobe was used to determine the S concentration in the glasses. Due to some heterogeneities in the quenched glasses, the concentration variation for some experiments causes the errors to overlap, and thus, obscure a trend of S concentrations under varying oxygen fugacities. This issue is currently under investigation and we are testing different analytical procedures in order to obtain smaller variations for some glasses. Overall, the concentrations for the lower temperature and pressure experiments are lower than for the higher temperature experiments. Whether this is a temperature or pressure effect will be evaluated in further experiments.