

# EXPERIMENTAL STUDY OF SHEELITE AND FLUORITE SOLUBILITY IN THE NaCl-H<sub>2</sub>O SYSTEM AT 800°C AND 0.5-2 Kbar

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URL: [http://www.scgis.ru/russian/cp1251/h\\_dgggms/5-2000/hydroterm23.eng](http://www.scgis.ru/russian/cp1251/h_dgggms/5-2000/hydroterm23.eng)

In addition to previously studies at 600°C [1], sheelite solubility in 1 and 5m NaCl solutions at 800°C and 0.5-2 kbar pressures in a homogenous and heterogeneous regions has been studied. Several fluorite solubility measurements at 800°C were also performed (1 and 5m NaCl solutions and 0.5, 1.6 and 1.8 kbar pressures) to improve the experimental data obtained earlier [2, 3].

The experiments were carried out in two chamber bombs with external heating, using the rapid isobaric quenching method. Sealed platinum capsules were used. Synthetic fluorite and sheelite monocrystals were used as starting materials. The method of monocrystal weight loss for the solubility determination was used. The weighing was done to  $\pm 0.005$  mg with a Sartorius 4503MP6 electronic microbalance.

It was found that at 800°C, in the same manner as at 600°C, the pressure dependence of the sheelite solubility had a minimum (figure).

As it was shown earlier [1, 3] the minimum corresponds to the point of fluid disintegration. The sheelite solubility in 1m NaCl solution sharply increases with pressure decrease in heterogenous region (more than one order of magnitude). This effect appears more slightly in 5m NaCl solutions. According to the H<sub>2</sub>O-NaCl phase diagram [4] the fluid disintegration of 1m NaCl (5.52 mass. %) and 5m NaCl (22.6 mass.%) takes place at about 1.3 and 1.4 kbar pressures correspondly. The obtained experimental data show that this happens at about 1.4 and 1.6 kbar pressures correspondly. It could be suggested that this discrepancy is due to the experimental error. The same dependencies were found earlier for fluorite under similar conditions. It could be assumed that the obtained effect of the sharp increase of the mineral solubility at 600 and 800°C in the NaCl-H<sub>2</sub>O system at the fluid heterogenization is common for other sparingly soluble minerals.

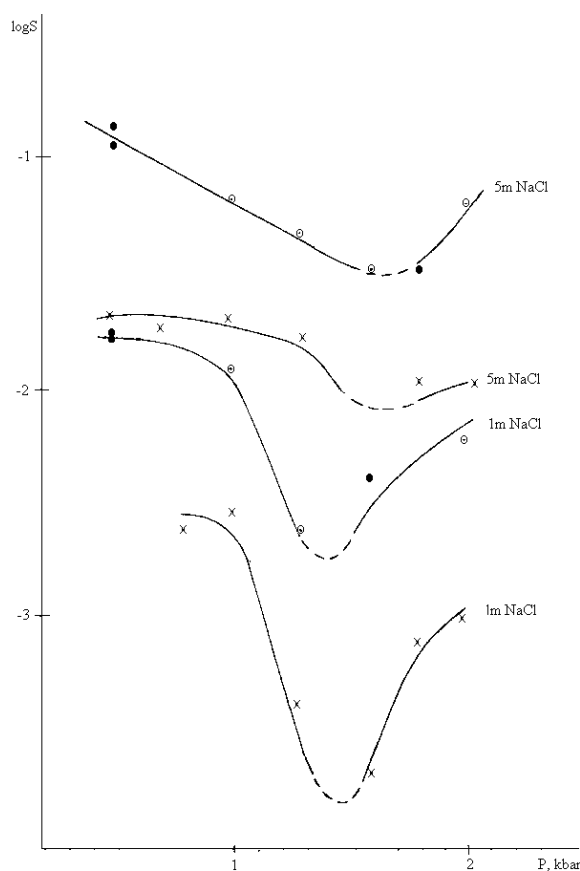


Fig. Solubility of sheelite and fluorite in NaCl-H<sub>2</sub>O solutions at 800°C.  
○ - fluorite; x - sheelite; ●, x - data of present study

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