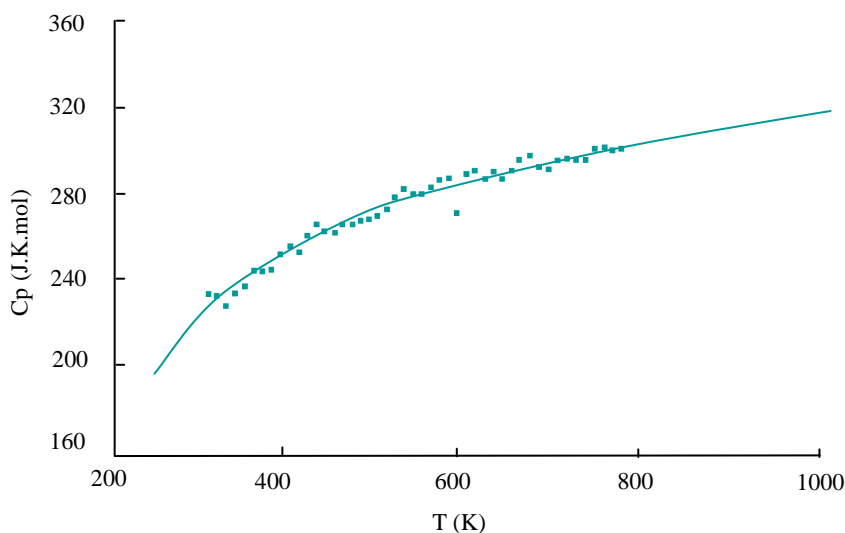


Thermodynamic properties of strontium and barium feldspars

Reference: M. GAMBINO, P. GAUNE and J.P. BROS
Thermochimica Acta, Vol 175 (1991) p 119-127

Introduction: The molar heat capacities of two synthetic Sr and Ba compounds were measured by differential scanning calorimetry between 312 and 712 K. In addition, heat capacities were calculated from a model of the vibrational spectra using optical frequencies measured by IR spectroscopy.



Plot of the heat capacity of $\text{BaAl}_2\text{Si}_2\text{O}_8$ against temperature computed from model of vibrational spectrum.

Experimental :

All heat capacity measurements were performed under purified argon flow using stainless steel calorimetric cells (6mm in diameter, 12 mm in length). These gas tight containers were closed by a nickel O-ring pressed between the cell and the lid.

Results :

The measured and calculated heat capacity values were used to calculate the standard entropies :

$$S_{298.15}(\text{SrAl}_2\text{Si}_2\text{O}_8) = 218.5 \pm 4.0 \text{ J.K}^{-1}.\text{mol}^{-1} \text{ and}$$

$$S_{298.15}(\text{BaAl}_2\text{Si}_2\text{O}_8) = 231.5 \pm 4.0 \text{ J.K}^{-1}.\text{mol}^{-1}$$

and also to propose the recommended equations :

$$C_p \text{ SrAl}_2\text{Si}_2\text{O}_8 = 269.59 + 5.784 \times 10^{-2}T - 5.833 \times 10^6 T^{-2} \text{ J.K}^{-1}.\text{mol}^{-1}$$

$$C_p \text{ BaAl}_2\text{Si}_2\text{O}_8 = 261.05 + 6.640 \times 10^{-2}T - 5.256 \times 10^6 T^{-2} \text{ J.K}^{-1}.\text{mol}^{-1}$$

for $250 < T/\text{K} < 1000$ (eqn. (4))

The results are given with an accuracy of about 3 % for C_p and $\pm 0.5\text{K}$ for T .

Instrument :

Sensys evo DSC (- 120, + 830°C)
in horizontal configuration.



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