

## High-temperature heat capacity measurements on natural uvarovite-rich-garnet.

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We report here, for the first time, the experimental results of heat capacity measurements on a natural uvarovite-rich ( 72 mol% uvarovite, 12 mol% grossular, 10 mol% andradite, 3.7 mol% almandine, and 1.4% spessartine) garnet , in the temperature range 300 to 1000 K. The differential scanning calorimetric heat capacity data were fitted to the Hass and Fischer equation for heat capacity:  $C_p = A + B T + C T^{-2} + D T^{-0.5} + E T^2$ . The values of the fitted parameters are 872.95, -0.148, -3.1175 E5, -8.599 E3 and 4.075 E-5 respectively. These values are found to be in excellent agreement with the theoretically calculated values obtained by static lattice energy and vibrational energy calculations for the garnet. The values of the coefficients are also found to be in the same range of those of mantle derived garnets, indicating that uvarovite is as stable as pyrope or knorringite in the pressure-temperature conditions of the Earth's mantle. This is supported by the report of occurrence of uvarovite-rich garnet in addition to pyrope and knorringite in many kimberlites.