

temperature limit for hot-pressing CrO_2 at higher pressures for the preparation of dense compacts. (2-6) Investigations by Goto and Kitamura, (7) by Somiya, Yamaoka, and Saito, (8) and particularly by White and Roy (9-11) have defined the equilibrium stability range to 5 kb and 650°C . Later data by these authors (11) to about 5 kb under probably very nearly equilibrium conditions are plotted in Fig. 1. Fukunaga (12) has recently completed an equilibrium study using a single-stage piston cylinder cell with sealed metal capsules to define the CrO_2 - Cr_2O_3 P-T curve to 35 kb and 1400°C . He has very kindly made his results available prior to publication. The present study extends the data to 60 kb and about 1500°C (but not entirely at equilibrium) and are sufficiently interesting to warrant comparison of results from the two different experimental conditions.

Experimental

Two types of internally heated high-pressure cells were used: (1) a pyrophyllite cell with an Al_2O_3 liner, (13) and (2) a cell with an NaCl inner liner similar to that described by Hanneman and Strong. (14) Most of the data are from runs on the second cell and for which the starting material was CrO_2 (Table I). A few higher temperature runs were made in the first cell with either CrO_3 , Cr_2O_5 , or CrO_2 as the starting composition (Table II). All the compositions in the Al_2O_3 -lined cell were wrapped with Pt foil while both wrapped and unwrapped samples were used in the NaCl-lined vessel with little or no difference in results. The starting materials were pressed into cylindrical pellet form (about 3 mm diameter by 3 mm height).