

TABLE VII

MgO SAMPLES SENT TO AFCRL

Sample No.	Pressure (psi)	Temperature (°C)	Heater	Knoop Hardness
82	110, 000	800	Ni tube	759
83	110, 000	800	Ni tube	825
87	110, 000	990	Ni tube	--
88	110, 000	1105	Ni tube	--
735	6, 000	1150	Graphite die	636
2	6, 000	1300 to 1400	Graphite die	--
45	250, 000	~ 845	Ni tube	--

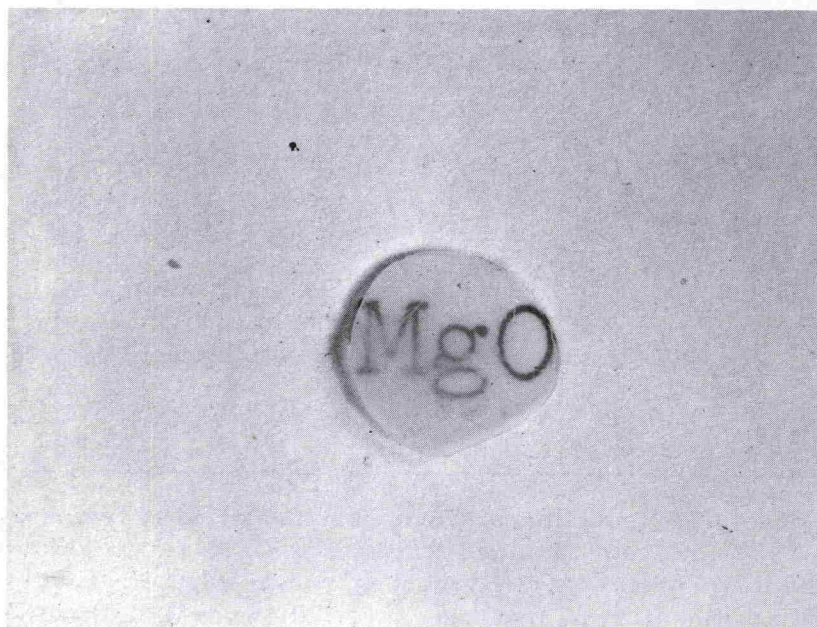
Some of the MgO specimens which were densified at temperatures below 800° C were dark blue, almost black. X-ray diffraction indicated that the blue specimens were mostly brucite ($\text{Mg}(\text{OH})_2$) with minimum amounts of the starting material MgO. It is possible that the decomposition of the pyrophyllite gasket material yields considerable amounts of water vapor which could cause the observed hydration. Samples were examined by infrared spectroscopy* in the range 2.5 to 16 microns and showed strong evidence of (OH) in both the stretching and bending ranges.

By raising the temperature to 850° C this reaction was prevented and completely transparent pieces were obtained. One such piece is shown in Figure 14. Infrared analysis showed no evidence of (OH).

b. NiO

Nickel oxide preparations are listed in Table VIII. The most interesting sample was sample 32 which contained many single crystals of NiO. Some of these crystals were isolated and transmitted light photomicrographs were taken of the crystal (Figure 15a and b). Some crystals

* Perkin Elmer Model 221 Infrared Spectrometer, Perkin Elmer Mfg., Norwalk, Conn.



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Figure 14 TRANSPARENT MgO