TABLE 1. Results of Runs on the Quartz-Coesite Transition at 1100°C

Starting Material*	Type of Pressure Cell	Run Procedure	Nominal Pressure, kb	Time, min	Results
Q	T	One-stage compression	35	60	Quartz + trace coesite (≪4%)
Q	T	One-stage compression	35.5	60	Quartz
Q	T	One-stage compression	36	60	Quartz + almost equal coesite
Q	T + BN$_2$	One-stage compression	35	60	Quartz
Q	T + BN$_2$	One-stage compression	35.5	60	Quartz
Q	T + BN$_2$	One-stage compression	36	60	Coesite + 50% quartz
C	T + BN$_2$	One-stage compression	35	60	Quartz
C	T + BN$_2$	One-stage compression	36	60	Coesite + trace quartz
Q	AgCl + BN$_2$	One-stage decompression	35	60	Coesite
Q	AgCl + BN$_2$	One-stage decompression	33	60	Coesite
Q	AgCl + BN$_2$	One stage decompression	31	60	Coesite + 60% quartz
Q	AgCl + BN$_2$	One-stage decompression	30	60	Quartz
Q	T + BN$_2$	Two-stage compression	35	60	Quartz
Q	T + BN$_2$	Two-stage compression	36	60	Coesite + 60% quartz
Q	AgCl + BN$_2$	Two stage compression	31	60	Quartz
Q	AgCl + BN$_2$	Two-stage compression	32	60	Quartz
Q	AgCl + BN$_2$	Two-stage compression	33	15	Coesite + 70% quartz
Q	AgCl + BN$_2$	Two-stage compression	34	50	Coesite
Q	T + BN$_2$	Two-stage decompression	30	60	Quartz
Q	T + BN$_2$	Two-stage decompression	32	60	Quartz
Q	T + BN$_2$	Two-stage decompression	33	60	Quartz + trace coesite (4%)
Q	T + BN$_2$	Two-stage decompression	34	60	Coesite + 60% quartz
Q	AgCl + BN$_2$	Two-stage decompression	30	60	Quartz
Q	AgCl + BN$_2$	Two-stage decompression	31	60	Quartz + trace coesite (<4%)
Q	AgCl + BN$_2$	Two-stage decompression	32	60	Coesite
C	AgCl + BN$_2$	Two-stage decompression	30.5	60	Quartz + 10% coesite
C	AgCl + BN$_2$	Two-stage decompression	31.5	55	Coesite

Q signifies mix composed of 94% quartz, 4% coesite, and 2% silicic acid.
C signifies mix composed of 90% coesite, 5% quartz, and 5% silicic acid.

1050°C, followed by final adjustment of pressure to the required value, and the procedure was completed with final adjustment of temperature to 1100°C.

3. Double-stage decompression. The pressure first applied was about 5 kb above the required value and then the temperature was increased to 1050°C. Release of pressure to the required value followed and finally the temperature was increased to 1100°C.

In this way the quartz-coesite equilibrium was approached from the quartz stability field (two-stage compression) or from the coesite stability field (two-stage decompression). At the conclusion of a run the sample was quenched by switching off the power to the furnace. The sample was then examined by optical and X-ray means, and the relative amounts of quartz and coesite were estimated.

RESULTS

The conditions and results of the runs are summarized in Table 1 and Figure 2. There is no difference between the results obtained using talc or talc + boron nitride as the pressure medium. Also there is no significant difference between single-stage and two-stage compression runs.

The quartz-coesite transition at 1100°C occurs at a nominal pressure of 35.5 kb in a two-stage compression run with a talc + boron nitride pressure medium and at 33.0 kb in a two-stage decompression run with the same pressure medium. Thus the difference in the pressure of the quartz-coesite transition between the two-stage compression and decompression runs is 2.5 kb. This is attributed to friction between the piston and the walls of