OR

re medium showed that the
ent in the space normally
pecimen capsule is less than
un, once thermal equilibrium
iperature varies by approxi-
ier side of the control point.
es are believed to have a
an ±10°C. Oil pressure ap-
measured with a Heise gage
of better than 0.1%. The
n the sample (i.e., assuming
on of applied pressure) is
measured oil pressure, using
ectional areas of the piston

naterials consisted of very
s of either (1) 94% quartz,
2% silicic acid or (2) 90%
z, and 5% silicic acid. The
se mixes was prepared from
ed to a temperature of 900
ssure of 40 kb for 2½ hours.
used for most of the runs. A
d to be in the quartz field
had demonstrably disap-
coesite field when the amount
d measurably. A few runs on
lemonstrated reversibility of

10 to 20 mg of undried sam-
platinum tube of wall thick-
ree different ways of achiev-
temperature conditions of a

compression. The pressure
required value, then the tem-
d to 1100°C. This method
ward piston movement when
igure 1a) and talc + boron
nediums (Figure 1b). It was
se it for the silver chloride +
sure medium (Figure 1c), but,
ture was increased, expansion
sulted in a pressure excess of
at in actual fact the run was
pressure had to be released.
lver chloride, the single-stage
essure and temperature re-
ression run.
e compression. The pressure
bout 2 kb below the required
erature was then raised to

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