

TABLE I
Noise thermometry under high pressure at room temperature

Temp. obtained by thermocouple (K)	Temp. obtained by noise (K)	Balanced resistance (Ω)	Atmospheric pressure		30 kbar	
			R_s	R_r	R_s	R_r
294.5	294.2	601.1	602.1	509.1	509.9	294.7
294.7	294.7	602.1	602.1	509.1	509.9	294.7
294.7	294.2	602.1	602.1	509.1	509.9	294.7

As for the correction of Cu/Const thermocouple, the balancing method (a) was employed. The results are shown in Fig. 3. In this measurement, R_s was 800 Ω under high pressure, and the duration of integrating time is 60 s. The points represented are the average values of 5 ~ 10 measurements. The result almost agrees with the extrapolation of Bundy's measurement obtained by the Belt apparatus.

The outputs of the calibrated thermocouple and those of the noise thermometer showed agreement within the range of 0.1% at room temperature and of 0.3% at 900 K, under the atmospheric pressure for the integrating time of 15 min. In principle, the accuracy of the measurement is increased by the extension of the duration of integrating time, but in the high pressure experiment, the difficulty of maintaining the pressure and temperature conditions in the pressure cell may restrict the total accuracy of the experiment. For the full discussion of the problem, it is desired to make much more measurements by this technique at high pressures, far beyond 30 kbar.

REFERENCES

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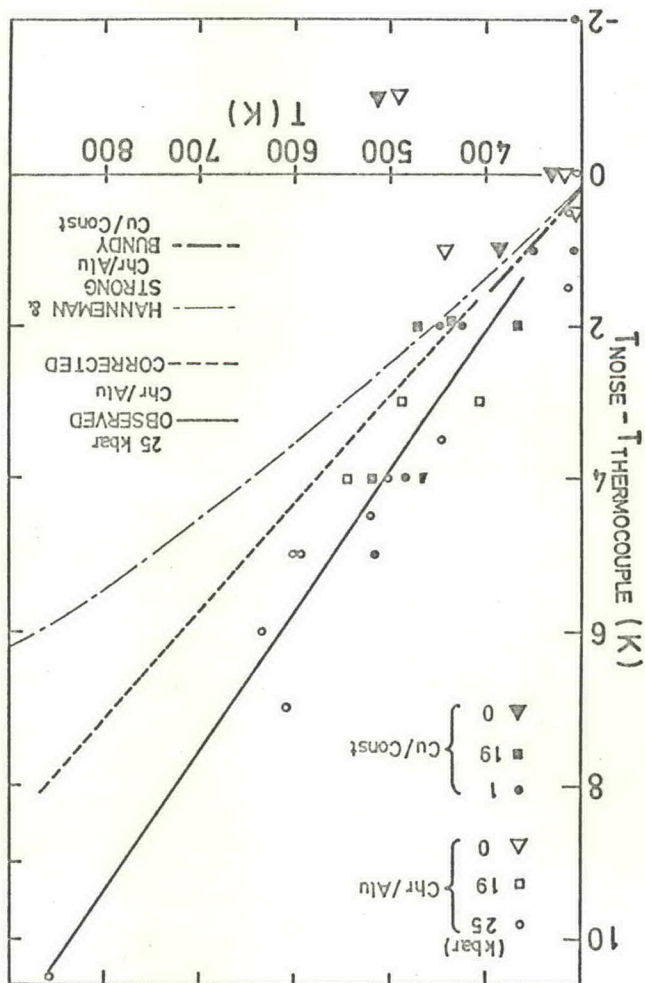


Fig. 3
Pressure correction of thermocouples.