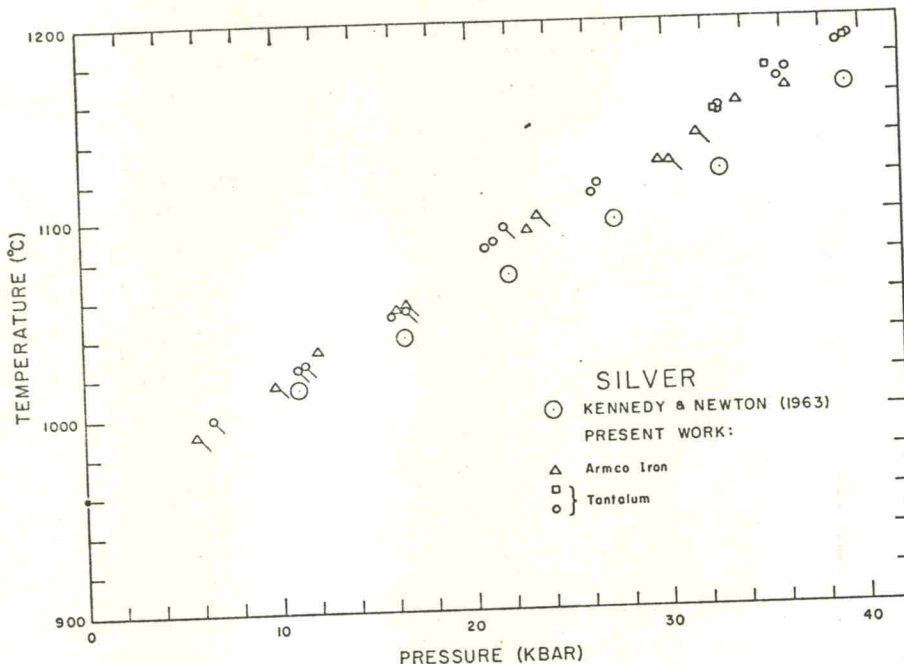


FIG. 2. Data for the melting of silver, together with the results of Kennedy and Newton. The various symbols correspond to different runs and container materials; the symbols with tails denote data obtained upon decompression cycles, those without tails refer to compression. The accepted zero-pressure melting point is indicated.



Armco iron and tantalum with Pyrex stoppers; there was no evidence for reaction between samples and containers, in accord with the more careful reports in the literature.⁷ Data in the range of 5 to 40 kbar were obtained and are shown in Fig. 2. Precise determinations of friction were made in each run and were less than 3 kbar, double-value. The data, uncorrected for any effects of pressure on thermocouple emf, are believed precise to $\pm 4^\circ$ and accurate to ± 1.0 kbar (Fig. 2).

The present data for silver, uncorrected for the effect of pressure on thermocouple emf, can be fitted with

straight lines of slope $5.87 \pm 0.27^\circ/\text{kbar}$ passing through the zero-pressure melting point of 960.8°C (Fig. 2).

If the thermocouple corrections according to the data of Hanneman and Strong⁸ are made, the slope is increased to $\sim 6.9^\circ/\text{kbar}$; according to Getting and Kennedy,⁹ the slope is altered to $\sim 6.0^\circ/\text{kbar}$. Kennedy and Newton³ reported data for the melting of silver in iron¹⁰ capsules up to 40 kbar; the melting temperatures, determined with chromel-alumel thermocouples, increased linearly with pressure at the rate of $5.0^\circ/\text{kbar}$ (Fig. 2). There are at least several possible reasons why

TABLE I. Pertinent thermodynamic data near the zero-pressure melting points.

	Copper	Silver	Gold	
Entropy of fusion (cal/g atom) ^a	2.3 ± 0.1	$\sim 2.3_1$	$\sim 2.2_1$	
Volume (cm ³ /g atom)	liquid	11.543 ± 13^e	11.4_0^d	
	solid	7.601^e	10.969^f	10.789^g
Volume change of fusion (cm ³ /g atom)	0.350 ± 11	0.574 ± 13	$\sim 0.6_1; \geq 0.56_0^h$	
$(\partial V/\partial T)_P (10^{-4} \text{ cm}^3/\text{g atom}^\circ)$	liquid	11.20 ± 2^e	$\sim 7.9^d$	
	solid ⁱ	$\sim 7.9_1^b$	9.69^f	7.31^g
$(\partial \Delta V/\partial T)_P (10^{-4} \text{ cm}^3/\text{g atom}^\circ)$	liquid	6.02^e	1.51 ± 2	~ 0.6
	solid ⁱ	$\sim 1.9_3$	~ 7.3	~ 7.0
C_p (cal/g atom ^o) ^a	liquid	~ 7.5	7.7_0	7.3_1
	solid	7.4_7	$-0.4 (\pm 0.2?)$	$-0.3 (\pm 0.1?)$
ΔC_p (cal/g atom ^o)	$0.0_3 (\pm 0.1?)$	$\sim 5.9_4 (\pm 0.3?)$	$\sim 6.0 - 6.6$	
(dT/dp) ($^\circ/\text{kbar}$) calculated	3.65 ± 0.27			

^a R. Hultgren, R. L. Orr, P. D. Anderson, and K. K. Kelley, *Selected Values for the Thermodynamic Properties of Metals and Alloys* (John Wiley & Sons, Inc., New York, 1963).

^b J. A. Cahill and A. D. Kirshenbaum, *J. Phys. Chem.*, **66**, 1080 (1962).

^c A. D. Kirshenbaum, J. A. Cahill, and A. V. Grosse, *J. Inorg. Nucl. Chem.*, **24**, 333 (1962).

^d R. O. Simmons and R. W. Baluffi, *Phys. Rev.*, **129**, 1533 (1963).

^e R. O. Simmons and R. W. Baluffi, *Phys. Rev.*, **119**, 600 (1960).

^f R. O. Simmons and R. W. Baluffi, *Phys. Rev.*, **125**, 862 (1962).

^g See Ref. 16.

^h See Ref. 13.

ⁱ Values deduced from measurements of macroscopic volume, not from lattice-parameter measurements.

¹⁰ R. C. Newton (private communication).