substance: gallium sulfide (GaS)
property: Debye temperature, heat capacity, density, hardness, melting point

Debye temperature

Θ_D	263 K	T = 4...10 K	heat capacity measurements	78M

For dependence on temperature, see Figs. 1 and 2.

heat capacity

(in J mol^{-1} K^{-1})

C_p	46.2	T = 300 K		72M

temperature dependence of C_p

A	41.35 J mol^{-1} K^{-1}	298 K ≤ T ≤ 1000 K	A, B are parameters in empirical	74M
B	1.57·10^{-3} J mol^{-1} K^{-1}		relation $C_p = A + BT$;	77M
			see also Figs. 3 and 4	
C_p	0.48	T = 10 K	calorimetric measurements	72M
	1.93	T = 20 K		
	4.33	T = 30 K		
	7.93	T = 40 K		
	11.01	T = 50 K		
	13.87	T = 60 K		
	16.76	T = 70 K		
	19.44	T = 80 K		
	22.14	T = 90 K		
	24.65	T = 100 K		
	27.00	T = 110 K		
	29.09	T = 120 K		
	30.97	T = 130 K		
	32.65	T = 140 K		
	34.13	T = 150 K		
	35.56	T = 160 K		

density

d	3.86 g cm^{-3}	RT		69R

hardness

H_B	4·10^6 g cm^{-2}			69R

melting point

T_m	1233 K		congruent melting	74M

For phase diagram of the Ga–S system, see Fig. 5.

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Fig. 1.
GaS. Debye temperature vs. temperature [77P].

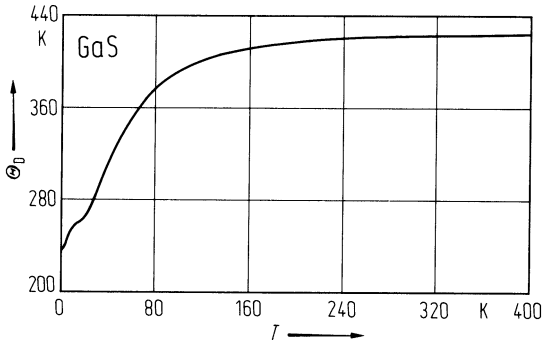

Fig. 2.
GaS, GaSe, GaTe. Debye temperature vs. temperature [78M].

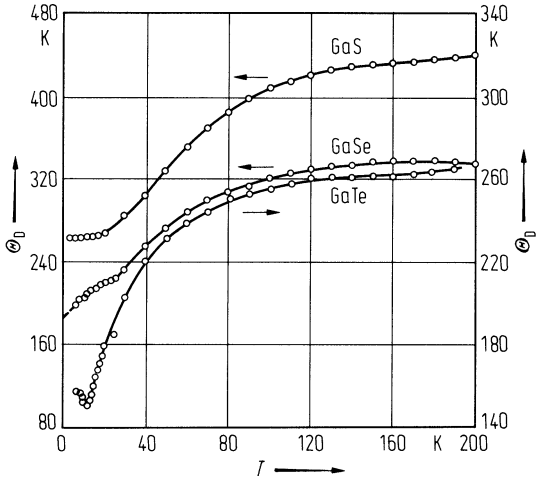

Fig. 3.
GaS. Heat capacity vs. temperature. *1*, Range 4...10 K, left scale; *2*, Range 10...30 K, right scale [77M].

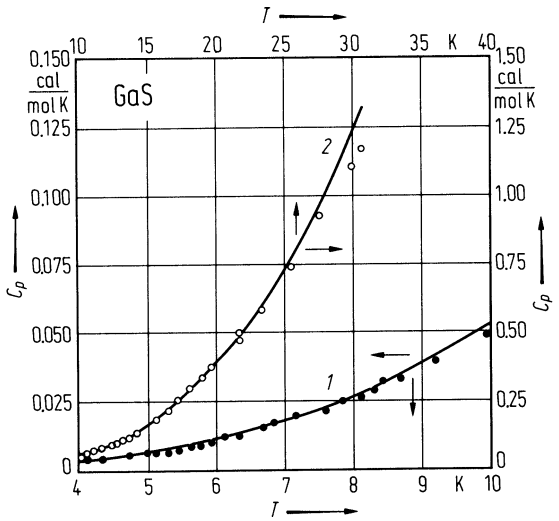

Fig. 4.
GaS, GaSe, GaTe. Heat capacity vs. temperature [78M].

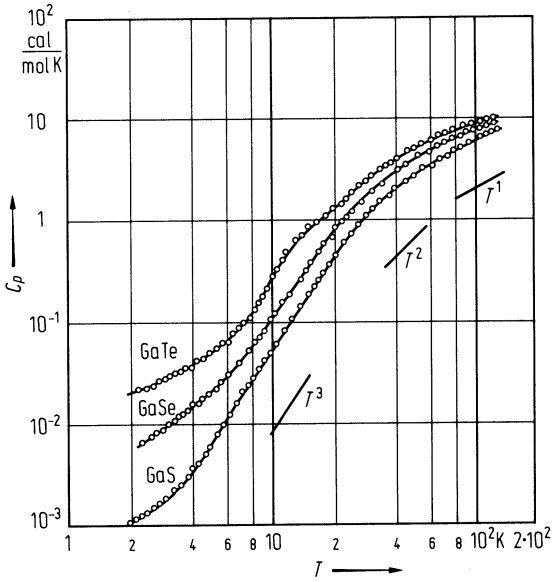

Fig. 5.
Ga–S. Temperature vs. composition. Phase diagram of the Ga–S system [66L]. L: liquid, S: solid, G: gaseous, open circles: [66L], full circles: [58S], ×: [34K], +: [30B].