

substance: CrS

property: crystal structure, physical properties

(The references in the last column refer to all data of this document)

lattice parameters, density

a	3.826 Å		structure: monoclinic, C2/c	57J,
b	5.913 Å		(hexagonal, space group	60K,
c	6.089 Å		$D_{3h}^4 - C \bar{6} 2c$ with $a = 2 \cdot 3^{1/2} a_0$	69P,
β	101°36'		$= 12$ Å and $c = 2c_0 = 11.74$ Å.	76V,
d	4.85 g cm ⁻³		where a_0, c_0 are the lattice	77J,
			parameters of undistorted B8 cell,	77M,
			also used for low temperature,	83H
			semiconducting phase [77L]).	

resistivity

ρ	0.1...1 Ω cm	p-type, poly- crystalline sample for CrS _x and $x \leq 1.12$	Semiconductor-metal transition at 550 K, $dT_{tr}/dp = -15$ K/kbar. Transition at 24 kbar (at RT) to metallic phase. Antiferromagnetic, $T_N = 450$ K, $p_A = 3.5 \mu_B/\text{Cr atom}$ at 80 K, moments directed along c axis.
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Figures to this document:

phase diagram: Fig. 1

magnetic susceptibility: Fig. 2

electrical conductivity, resistivity: Figs. 3, 4

References:

- 57J Jellinek, F.: Acta Crystallogr. 10 (1957) 620.
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69P Popma, T. J. A., Van Bruggen, C. F.: J. Inorg. Nucl. Chem. 31 (1969) 73.
76V Vaidya, S. N., Karunakaran, C., Joshi, D. K., Karkhanavala, M. D.: Proc. Nucl Phys. Solid State Phys. Symp. 19C (1976) 44.
77J Joshi, D. K., Karunakaran, C., Vaidya, S. N., Karkhanavala, M. D.: Mater. Res. Bull. 12 (1977) 1111.
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Fig. 1.

Cr_{1-x}S . Phase diagram (temperature vs. composition) for $x < 0.17$ [69P].

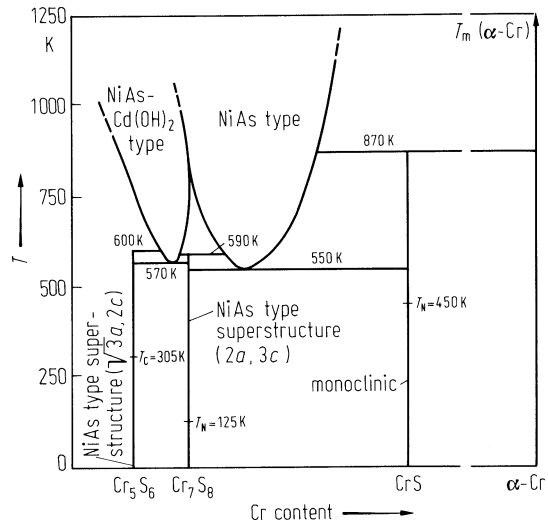


Fig. 2

$\text{Cr}_{0.96}\text{S}$. Reciprocal magnetic susceptibility per g-atom Cr (in CGS-emu) vs. temperature. Curve a: heating curve of "slowly cooled" specimen, b: cooling curve of "slowly cooled" specimen, c: heating curve of "quenched" specimen [69P]. Polycrystalline sample.

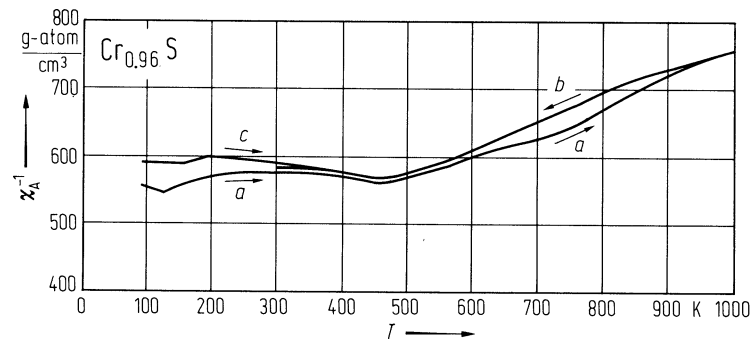


Fig. 3.

CrS. Electrical conductivity vs. reciprocal temperature [77J].

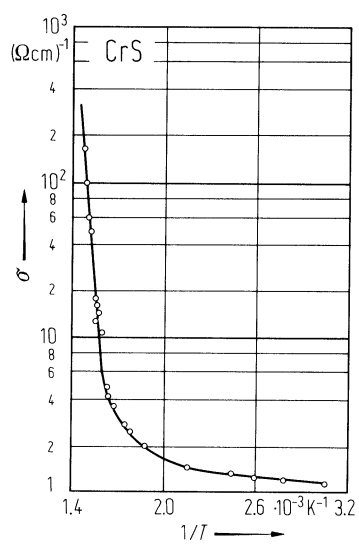


Fig. 4.

CrS. Resistance vs. pressure at RT [77J].

