08.5-07 STRUCTURE AND MAGNETIC PROPERTIES OF ALKALICHALCOGENOFERRATES.

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Ternary ferrates of general composition $AFeX_2$ and A_3FeX_3 (A ≙ alkali metal; X ≙ S or Se) have been prepared by fusion reactions:

Na_3FeS_3	$KFeS_2$	$RbFeS_2$	$CsFeS_2$
Na_3FeSe_3	$KFeSe_2$	$RbFeSe_2$	$CsFeSe_2$

X-ray investigations on single crystals revealed their structures. They are characterized by frameworks of edge-sharing tetrahedra, consisting of S- or Se-atoms, centered by iron-atoms, which build up chains in the case of $AFeX_2$ compounds and isolated double-tetrahedra in the case of A_3FeX_3-compounds. Susceptibility measurements and the determination of the spin structures by neutron diffraction show - dependent on the ligand field parameters - the existence of low spin states of the iron atoms in their tetrahedral environment. This phenomenon has not been observed up to now (Angew. Chemie (1981) 93, 12).