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THE STUDY OF MAGNETIC PHASE DIAGRAM OF

 $\text{Fe}_{1-x}\text{Zn}_x\text{Cr}_2\text{S}_4$ SOLID SOLUTIONS

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Abstract: A magnetic phase diagram of $\text{Fe}_{1-x}\text{Zn}_x\text{Cr}_2\text{S}_4$ solid solutions was studied. The temperature and concentration ranges of existence of magnetoactive phases based on ferrimagnet FeCr_2S_4 ($0 \leq x \leq 0.63$), antiferromagnet ZnCr_2S_4 ($0.73 \leq x \leq 1$), and a spin glass ($0.63 \leq x \leq 0.73$) were determined. The concentration dependences of the saturation magnetic moments and Curie temperatures of the solid solutions synthesized were investigated experimentally and theoretically.

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INTRODUCTION

Magnetic semiconductors, *i.e.*, spinel-type solid solutions $\text{Fe}_{1-x}\text{Zn}_x\text{Cr}_2\text{S}_4$ and their constituents have been a subject of regular interest to researchers who study new physical phenomena and effects [1, 3]. A remarkable example in this connection is provided by recent studies [4-8] on the colossal magnetoresistance in such materials. A new tide of interest in the $\text{Fe}_{1-x}\text{Zn}_x\text{Cr}_2\text{S}_4$ system gave us an impetus to continue on the object the research began earlier in 2000 [9].

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