Mössbauer study of $Cu_{0.5}Fe_{0.5}Cr_2S_4$

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$Cu_{0.5}Fe_{0.5}Cr_2S_4$ has been studied by Mössbauer spectroscopy and x-ray diffraction. The crystal structure is found to be a cubic spinel with the lattice parameter $a_0 = 9.922$ Å. The temperature dependence of both the magnetic hyperfine field and magnetization is explained by the Néel theory of ferrimagnetism using three exchange integrals: $J_{\text{Fe-Cr}}/k_B = -13.7$ K, $J_{\text{Fe-Fe}}/k_B = -8.3$ K, and $J_{\text{Cr-Cr}}/k_B = 8.7$ K.