

Magnetic Properties of $\text{Cu}_{0.5}\text{Fe}_{0.5}\text{Cr}_2\text{S}_{3.8}\text{Se}_{0.2}$

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(Received 20 March 1991)

$\text{Cu}_{0.5}\text{Fe}_{0.5}\text{Cr}_2\text{S}_{3.8}\text{Se}_{0.2}$ has been studied by Mössbauer spectroscopy and X-ray diffraction. The crystal structure is found to be a cubic spinel with the lattice constant $a_0 = 9.907 \text{ \AA}$. The temperature dependence of both the magnetic hyperfine field and magnetization is explained by the Néel theory of ferrimagnetism using three exchange integrals: $J_{\text{Fe-Cr}}/k_B = -13.3 \text{ K}$, $J_{\text{Fe-Fe}}/k_B = -8.4 \text{ K}$, and $J_{\text{Cr-Cr}}/k_B = 8.5 \text{ K}$.