

Mössbauer Study of $\text{FeS}_{0.4}\text{Se}_{0.6}$

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$\text{FeS}_{0.4}\text{Se}_{0.6}$ has been studied using the Mössbauer effect and X-ray diffraction. We find that it crystallizes either in the hexagonal NiAs structure or in the tetragonal PbO structure, depending on the method of preparation. The quenched sample of $\text{FeS}_{0.4}\text{Se}_{0.6}$ has the transforms abruptly to the tetragonal structure at 345 K.

Analysis of Mössbauer spectra at room temperature show that the magnetic hyperfine field and quadrupole shift for the hexagonal structure are 274 kOe and -0.068 mm/s, respectively, and the quadrupole splitting for the tetragonal structure is 0.228 mm/s.