

## Study of Atomic Migration in $\text{CoFe}_2\text{O}_4$ Using the Mössbauer Effect

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Slowly cooled  $\text{CoFe}_2\text{O}_4$  has been investigated over a temperature range from 13 to 880 K using the Mössbauer technique. The spectra have been fitted with two sextets in the ferrimagnetic state. X-ray diffraction shows that  $\text{CoFe}_2\text{O}_4$  has an inverse spinel structure and a lattice constant,  $a_0$ , of  $8.381 \pm 0.005$  Å. The iron ions at both *A* (tetrahedral) and *B* (octahedral) sites are found to be in ferric high-spin states. The Néel temperature  $T_N$  is found to be  $870 \pm 3$  K. The Debye temperatures for the *A* and *B* sites are found to be  $735 \pm 5$  K and  $248 \pm 5$  K, respectively. Atomic migration from the *A* to the *B* sites starts near 400 K and increases rapidly with increasing temperature to such a degree that 57% of the ferric ions at the *A* sites have moved over to the *B* sites by 780 K.