

Mössbauer Studies of Ferrihydrite for Fischer-Tropsch Catalysts

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The 6-line ferrihydrite sample for Fischer-Tropsch catalysts was prepared by using a combination of a co-precipitation technique and a spraydrying method. The crystallographic and magnetic properties of 6-line ferrihydrite sample were investigated by using x-ray diffractometer (XRD), vibrating sample magnetometer (VSM), and Mössbauer spectrometer. The XRD patterns of the ferrihydrite sample, measured at 295 K, showed 6-lines peak and its structure was found to be a single-phased hexagonal with space group of $P3m1$ according to JCPDS card. The temperature-dependent magnetization curves were measured under 1000 Oe between 4.2 and 300 K, and showed blocking temperature (T_B) around 110 K. Also, Mössbauer spectra of the 6-line ferrihydrite sample were taken at various temperatures ranging from 4.2 to 295 K. At temperature below T_B , the obtained spectra were analyzed as two-sextets for Fe sites, while At temperature above T_B , the obtained spectra showed a doublet due to relaxation, resulting from the spin dynamic effect.

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