Fischer-Tropsch (FT) Synthesis over Cobalt Supported Silica and Titania Catalysts

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The catalysts were prepared according to conventional incipient impregnation method using cobalt nitrate and silica gel and titania as supports. Physico-chemical properties of these catalysts were monitored by using XRD, FTIR, TEM, N2-physisorption and by TPR techniques.

The average particle size of both the catalysts was calculated using the full width at half maximum (FWHM) of the most intense peak (311) of the XRD diffraction pattern using Debye-Scherrer equation and was found to be in nanometer scale range. Both catalysts showed an isotherms which can be classified as type IV according to the IUPAC convention and is typical of mesoporous material. TEM micrographs of both samples showed round shaped nanosize particles supporting XRD data. TEM electron diffraction pattern showed continuous rings representating very large number of small nanosized, randomly distributed crystals.

Catalytic performance of these catalysts was investigated for Fischer-Tropsch synthesis at various temperature, pressure and feed molar ratio.