

# Synergetic Effect of La and Ba Promoters on Nanostructured Iron Catalyst in Fischer-Tropsch Synthesis

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**摘要** Effect of promoters such as Barium and Lanthanum has been investigated on the conventional nanostructured iron catalyst in Fischer-Tropsch synthesis (FTS). The nanosized iron-based catalysts were prepared by a microemulsion method with the general formulation of 100Fe/4Cu, 100Fe/4Cu/2La, 100Fe/4Cu/1La/1Ba, and 100Fe/4Cu/2Ba. The phase, structure, and morphology of the catalysts were characterized by X-ray diffraction, N<sub>2</sub> adsorption, transmission electron microscopy, temperature-programmed desorption of CO<sub>2</sub>, and temperature-programmed reduction. The results indicated that the addition of promoters could improve the activity of Fe catalysts for FTS and WGS (water-gas shift reaction) and lower the gas fraction at the outlet. In addition, both Ba- and La-promoted Fe catalysts exhibit the highest activity due to the synergetic effect.

**关键词:** [nanosized iron catalyst](#) [microemulsion method](#) [Fischer-Tropsch synthesis](#) [promoter effect](#)

**Abstract:** Effect of promoters such as Barium and Lanthanum has been investigated on the conventional nanostructured iron catalyst in Fischer-Tropsch synthesis (FTS). The nanosized iron-based catalysts were prepared by a microemulsion method with the general formulation of 100Fe/4Cu, 100Fe/4Cu/2La, 100Fe/4Cu/1La/1Ba, and 100Fe/4Cu/2Ba. The phase, structure, and morphology of the catalysts were characterized by X-ray diffraction, N<sub>2</sub> adsorption, transmission electron microscopy, temperature-programmed desorption of CO<sub>2</sub>, and temperature-programmed reduction. The results indicated that the addition of promoters could improve the activity of Fe catalysts for FTS and WGS (water-gas shift reaction) and lower the gas fraction at the outlet. In addition, both Ba- and La-promoted Fe catalysts exhibit the highest activity due to the synergetic effect.

**Keywords:** [nanosized iron catalyst](#), [microemulsion method](#), [Fischer-Tropsch synthesis](#), [promoter effect](#)

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