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# Catalytic properties and activity of copper and silver containing Al-pillared bentonite for CO oxidation

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Al-pillared bentonite (Al-PB) using bentonite obtained from the middle Anatolia region (Hançılı) was synthesized, and Cu@Al-PB and Ag@Al-PB were obtained after the second metal impregnation step. Cu/Al-PB prepared using a hydrothermal method which was obtained with a Cu/(Cu+Al) mole ratio of 0.05 Copper and silver incorporation resulted in approximately 0.35 nm decrease in basal spacing. Surface area of Al-PP measured as 226 m2/g at 5000C was observed to be decreased a little by hydrothermal copper incorporation. XRD, SEM/EDS, scanning electron microscopy/energy dispersive X-ray spectroscopy analyses indicated that impregnation method resulted in a higher copper loading in the structure. Based on XRD, XPS, X-ray photoelectron spectroscopy analysis, the aluminum in all of the samples was in the $Al_2O_3$ form with 2s and 2p3 orbitals. Although no copper peaks were observed for Cu/Al-PB, the 2p3 and 2p1 orbitals of copper. It was also observed that the 3d3 and 3d5 orbitals of silver were observed in the copper or silver impregnated samples, respectively. Metal incorporation resulted in especially, an increase in strengths of the bronsted acid peaks in the Fourier transform infrared spectra (FTIR). Intensity of the peaks corresponding to bronsted sites did not change substantially as pyridine desorption temperature increased. Impregnated samples created a decrease in the 50% conversion temperature for CO oxidation. Cu@Al-PB, which was calcined at 5000C, gave a CO conversion that was as high as 100% at approximately 2000C and maintained its activity to 5000C. Hence, in impregnated samples, the reaction may use the surface oxygen which is provided by the metal oxide.

## Biography

Suna Balci has completed her PhD in the year 1992 from Middle East Technical University, Turkey. She has been working as a Professor in Gazi University. She has published 25 papers in journals indexed by SCI and more than 55 presentations in international conferences.

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