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Removal of Cu^{++} Ions from Aqueous Cu-EDTA Solution using Nanometer Size Zinc Oxide Heterogeneous Photocatalyst Powder

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Nanometer size zinc oxide (ZnO) powder was prepared by a noble "Solution-Combustion Method (SCM)" and it was used as a semiconductor photocatalyst to evaluate its photoreduction properties. Aqueous solution of heavy metal ions (Cu-EDTA) was used for the photocatalysis reaction under UV illumination The result was then compared with other semiconductor photocatalyst powders such as titanium dioxide (TiO_2) powder (P_25, Degussa) and TiO_2 powder prepared by Homogeneous Precipitation Process at Low Temperature (HPPLT) The zinc oxide nanopowder showed the fastest removal rate of the Cu^{++} ions from the solution among the photocatalyst powders compared. The superior photoreduction ability of the ZnO nanopowder appears to be due to its excellent UV absorption capacity.

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Preparation and Characterization of MFI Type Zeolite Membranes on Porous Alumina Supports

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Zeolite materials have been drawn attention in the fields of catalyst, membrane and sensor as functional materials Among them, zeolite membranes are recommended for hydrophilic separation at pervaporation of CO_2 separation/recovery, or steam permeation of water/organic mixtures

This study focuses on synthesis of nanosized MFI type zeolite powders and thin film membranes. In previous our result, TPA-silicalite-1 were synthesized about 100 nm with a molar composition of 1 0TPAOH 3 $0SiO_2$ $75H_2O$ with silica source such as fumed silica Two stage synthesis at 60°C and 100°C was effected to enhance the nucleation kinetics for the synthesis of nanosized TPA-silicalite-1 ZSM-5 powders sized about 150 nm were used TEOS as silica source and synthesized with a molar composition of 21 4TPAOH xSiO2 $650H_2O$ $yAl(NO_3)_3$ (x/y=10~60)

MFI type zeolite thin films were prepared with gel composition as same as upper Thickness and morphology of membrane are expected to control by synthesis time and precursor concentration The film formation and membrane pore structure by zeolite growth are characterized by Field Emission Scanning Electron Microscopy (FE-SEM), X-Ray Diffractometry (XRD) and Energy Dispersive X-ray diffractometry (EDX)