

## Application of TiO<sub>2</sub>-Coated Zeolite Particles for NO and SO<sub>2</sub> Removals by Dielectric Barrier Discharge Process

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The dielectric barrier discharge-catalyst (DBD-C) hybrid process and dielectric barrier discharge-catalyst-photocatalyst (DBD-C-P) hybrid process were analyzed for NO and SO<sub>2</sub> removals. In DBD-C hybrid process, zeolite particles were used as dielectric materials and catalysts for dielectric barrier discharge; in DBD-C-P hybrid process, zeolite particles were coated with TiO<sub>2</sub> photocatalyst by a rotating cylindrical PCVD reactor to investigate the combined effects of plasma-catalyst-photocatalyst on NO and SO<sub>2</sub> removals. TiO<sub>2</sub> photocatalyst was coated partially on the zeolite surface while keeping the porous structure of zeolite. The NO and SO<sub>2</sub> removals were studied for various process variables such as applied peak voltage, initial NO and SO<sub>2</sub> concentrations, pulsed frequency and residence time. The NO and SO<sub>2</sub> removal efficiencies in the DBD-C-P hybrid process are 1.02-3.4 times and 1.03-4 times higher, respectively, than those in the DBD-C hybrid process for the process variables in this study. We found that the zeolite particles coated with TiO<sub>2</sub> photocatalyst by a rotating cylindrical PCVD reactor could be effectively used to remove NO and SO<sub>2</sub> in DBD-C-P hybrid process.