

## Preparation of column shape $\text{TiO}_2$ by diffusion flame reactor and their photocatalytic properties

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Column shape  $\text{TiO}_2$  nanoparticles were successfully prepared by diffusion flame reactor with the mixture of titanium (IV) isopropoxide (TTIP) and tetraethoxysilane (TEOS). The photocatalytic activities of  $\text{TiO}_2$  obtained by variations of several parameters such as different ratios (wt %) of TTIP to TEOS (10:1, 4:1, 2:1, and 4:3) and three kinds of carrier gas (air, nitrogen, and argon) were measured by the photodecomposition of acetaldehyde. In addition, the photocatalytic activities with morphological changes were compared with those of commercial  $\text{TiO}_2$  (Degussa P-25) powder. The morphology, thermal characteristics, the crystal form, the components, and the absorbance of  $\text{TiO}_2$  were confirmed by FE-SEM, TG / DTA, Raman, EDX, UV-Vis, respectively.