

## Photocatalytic Decomposition of Dodecane

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From 1996 and further before, to satisfy NO<sub>x</sub> emission standards of Diesel fuel vehicles, many related researchers have made their effort to search the best additive in diesel fuel, change ignition way and fuel to air ratio, find new method in engine modification, such as exhaust gas circulation, and develop high activity catalyst at converter to reduce NO<sub>x</sub> to neutral N<sub>2</sub> using various reducing agents like hydrocarbon, urea, oxygenated hydrocarbon and H<sub>2</sub>.

One way to produce oxygenated hydrocarbon and H<sub>2</sub> is the photocatalytic degradation of hydrocarbon, such as Dodecane, a representative compound of diesel fuel. When Dodecane was photocatalyzed in O<sub>2</sub> atmosphere batch system by using Pt(1wt%)-TiO<sub>2</sub>, and NiO (1wt%)-La<sub>2</sub>Ti<sub>2</sub>O<sub>7</sub>, H<sub>2</sub> and unknown oxygenated hydrocarbon were produced.

After setting up the complete continuous flow system, most of Dodecane was decomposed into CO<sub>2</sub> and little amount of it was partially oxidized to ketone and polymerized to alkyne. At semi continuous flow system, enough amounts of H<sub>2</sub> and oxygenated hydrocarbon, carboxylic acid, aldehyde, and ketone were acquired just by heating Dodecane with O<sub>2</sub> flow.