Environmental Assessment of CFC Alternatives

- Reaction Rate Constant against OH Radicals -

Kazuaki TOKUHASHI,
Akira SEKIYA
Research Center for Developing Fluorinated Greenhouse Gas Alternatives
e-mail:
k.tokuhashi@aist.go.jp
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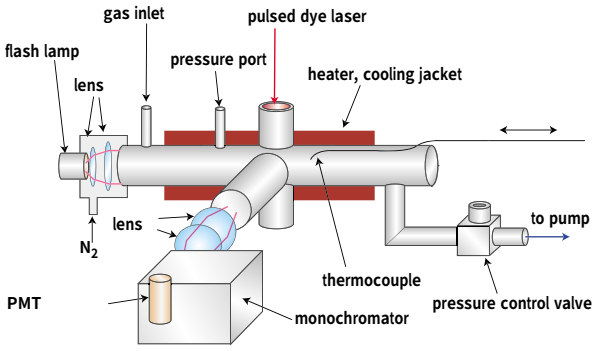
GWP (global warming potential) of CFC (chlorofluorocarbon) alternatives is estimated from the atmospheric lifetime and the infrared absorption intensities. In general CFC alternatives are expected to be oxidized by OH radicals in the atmosphere. Therefore, study of the reactivity against OH radicals is indispensable for the evaluation of atmospheric lifetime of these molecules. We report the kinetic measurements with high accuracy for the reactions of OH radicals with CFC alternatives.



Schematic diagram of flash photolysis/laser induced fluorescence apparatus

Catalytic Technology for Producing Clean Diesel Oil

Yuji YOSHIMURA
Research Institute for Green Technology
e-mail:
y.yoshimura@aist.go.jp
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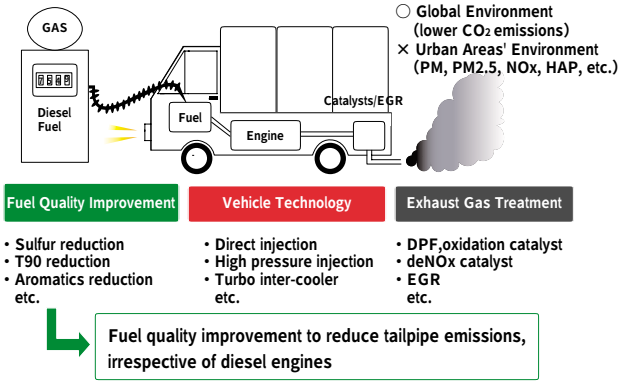
The environmental pressures demand high specifications for diesel oil to reduce the emissions of particulate (PM), NOx and hazardous air pollutants in diesel-exhaust gases. We developed the bimetallic Pd-Pt catalysts supported on ytterbium-modified USY zeolites that showed excellent hydrodesulfurization (HDS) and hydrodearomatization (HDA) activity, and high sulfur and nitrogen tolerance for producing clean diesel oil. We then developed the extrudated form of catalysts available in industrial use, such as Pd-Pt/Yb-USY-Al_2O_3, and confirmed their excellent performances to produce clean diesel oil containing low amounts of sulfur and polyaromatics during the time on stream of 2700 h in a bench-scale high-pressure plant. We further confirmed that the resulting clean diesel oil was effective for the reduction of PM emissions.



Technological Measures against Diesel Emissions Reduction