Supporting Information

Selective oxidation of polyolefins to carbon monoxide by photo-assisted catalysts

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Contents of Supporting Information

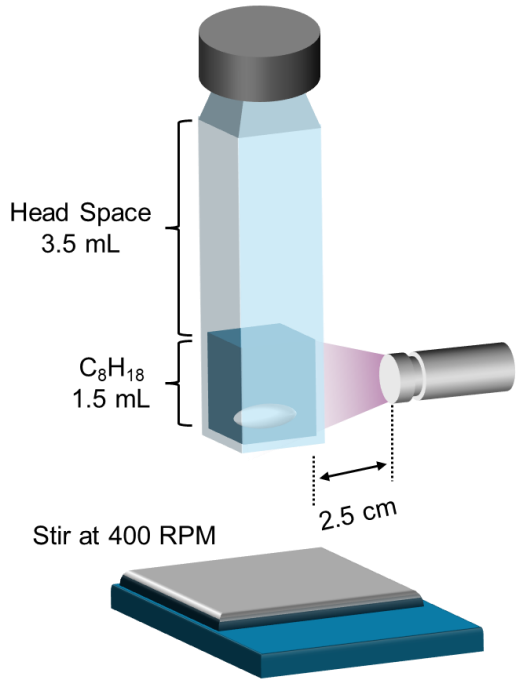

Figure S1. Experimental setup for the degradation of *n*-octane (C_8H_{18}). Catalyst powder was dispersed in the liquid of C_8H_{18}.

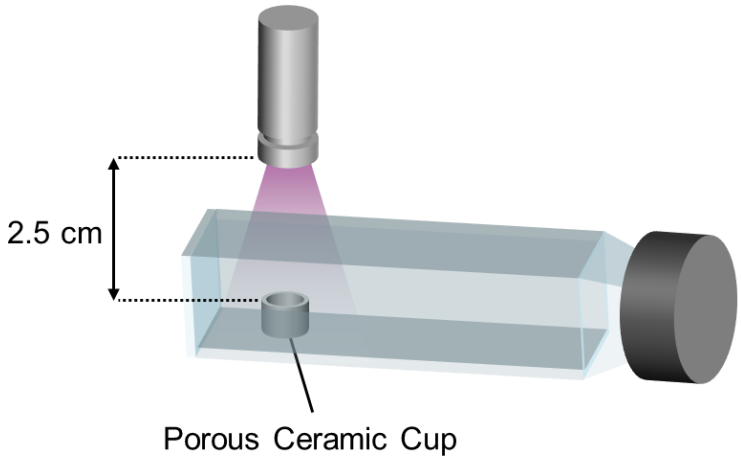

Figure S2. Experimental setup for the degradation of LDPE. The mixture of catalyst powder and LDPE was placed on the ceramics cup.

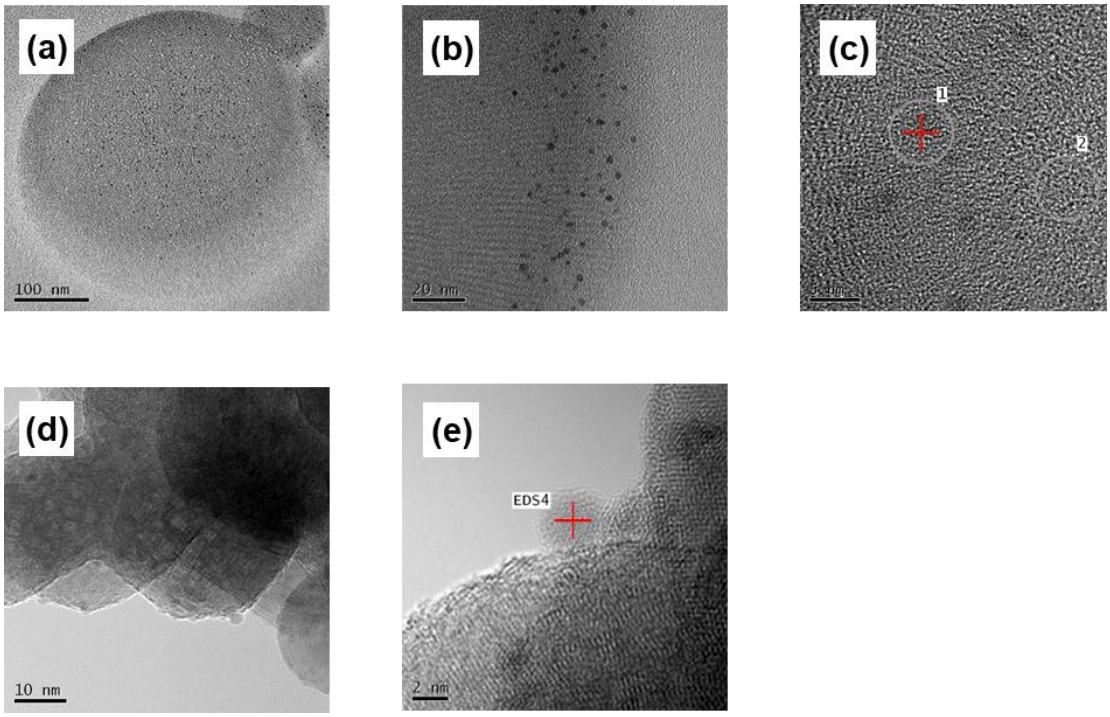

Figure S3. TEM images of Rh/MCM-41 (a- c), and those of Rh/$SrTiO_3$ (d, e). Red crosses in panel (c) and (e) represent the point of EDS analysis of Figure S4.

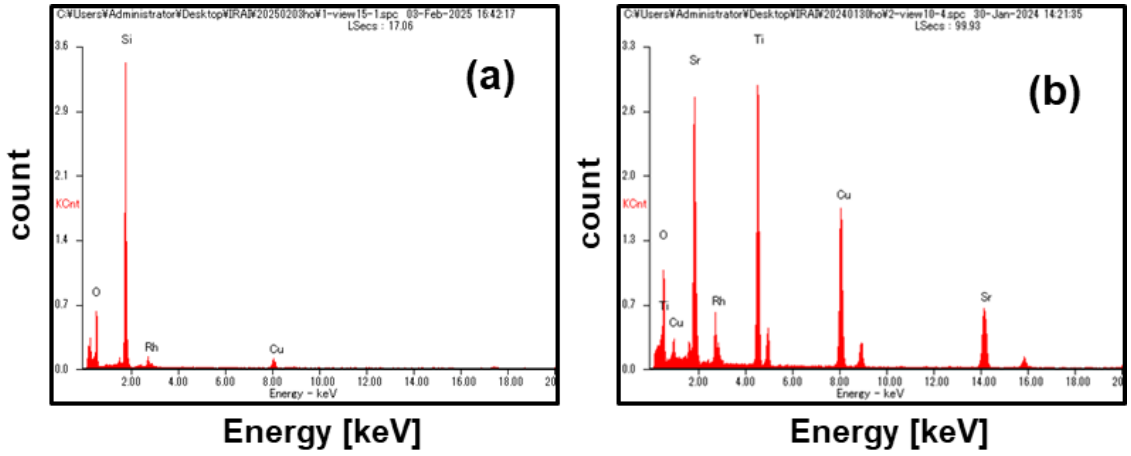

Figure S4. EDS spectra of Rh/MCM-41 (a), and Rh/$SrTiO_3$ (b). Electron beam was focused on the red crosses in Figure S3. In both figures, Rh signals were seen.

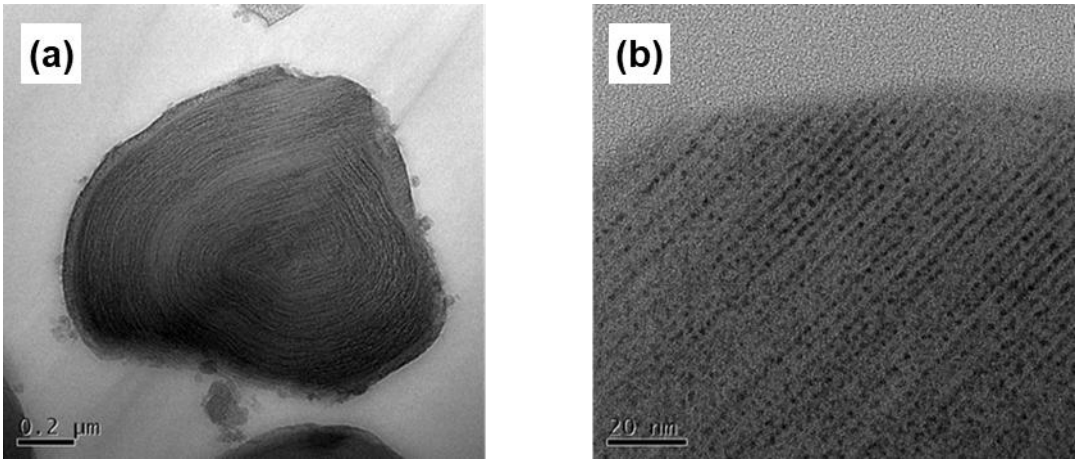

Figure S5. TEM images of Rh/MCM-41 fabricated using commercial MCM-41 using an ion slicer (a), ant its high-resolution image (b).

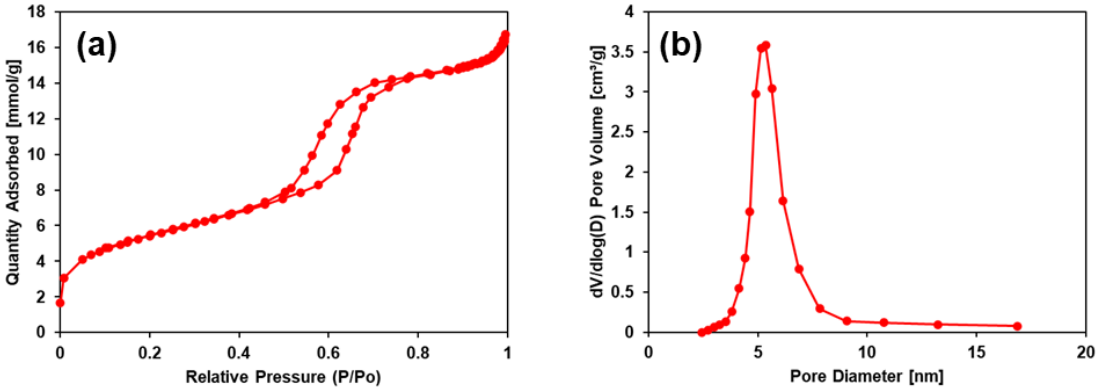

Figure S6 BET isotherm of Rh/MCM-41 (a), and mesopore distribution of Rh/MCM-41 (b).

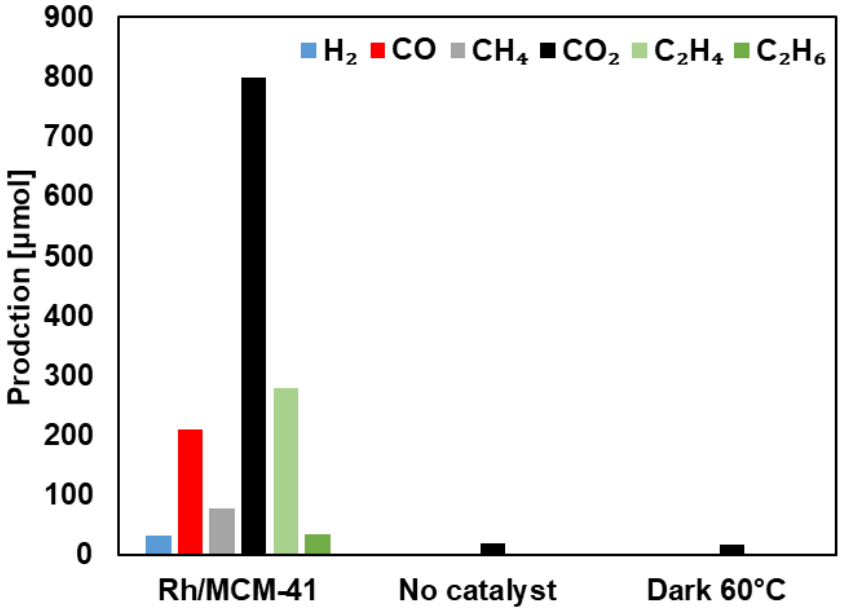

Figure S7. The amount of gas products through C_8H_{18} degradation for various conditions.

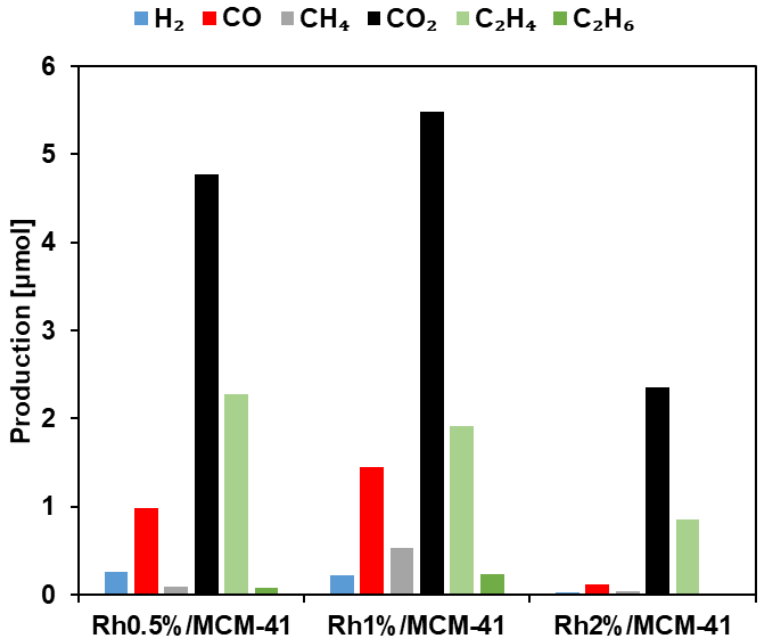

Figure S8. The amount of gas produced from C_8H_{18} degradation using Rh/MCM-41 with different Rh loadings.

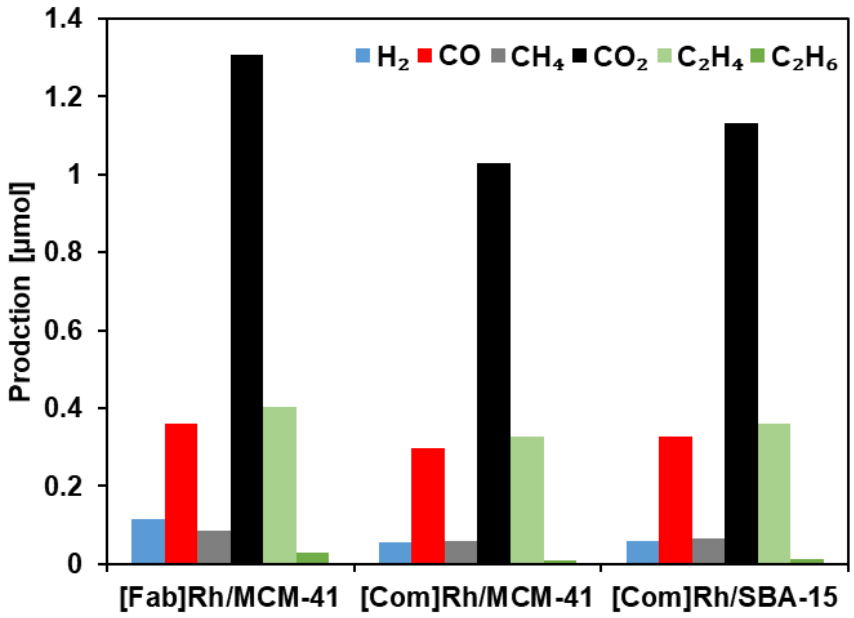

Figure S9. The amount of gas products through C_8H_{18} degradation for various Rh-loaded mesoporous SiO_2.

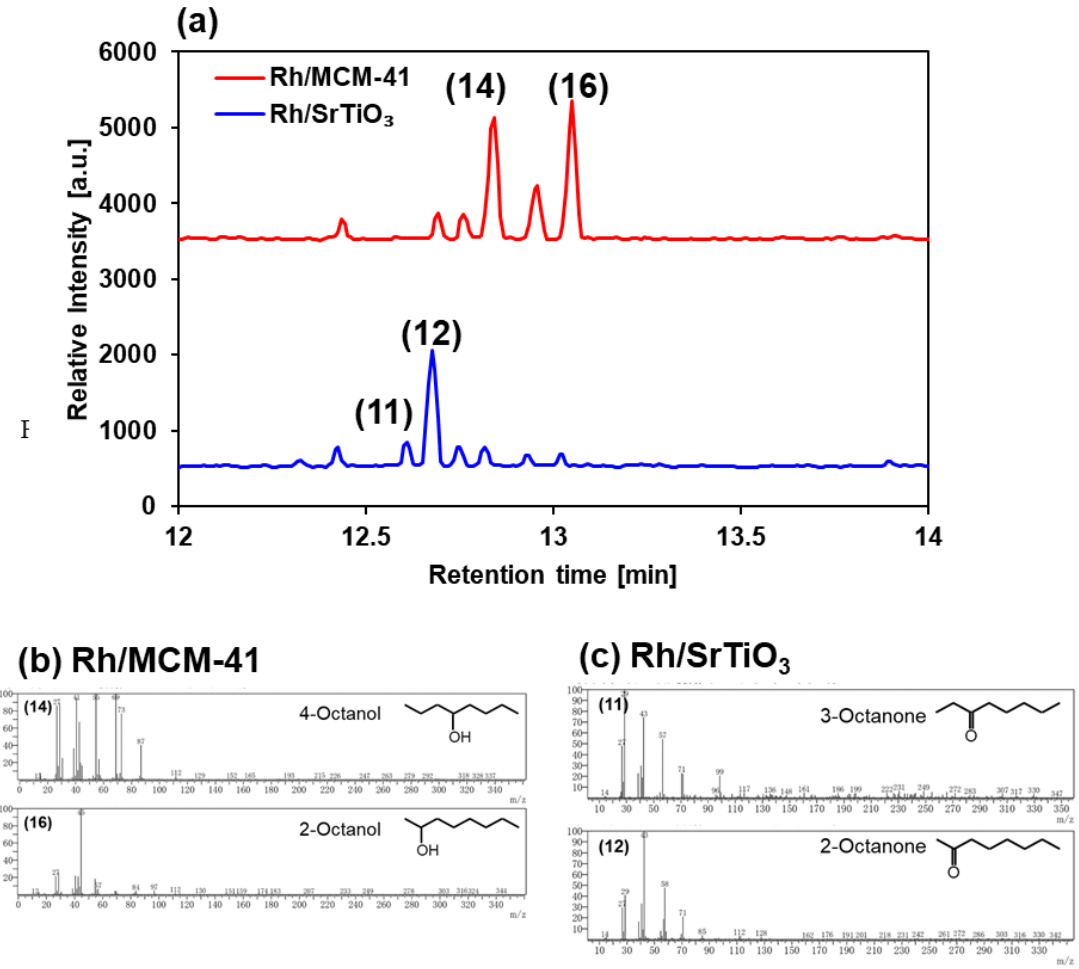

Figure S10. The mass spectra of liquid products from C_8H_{18}.

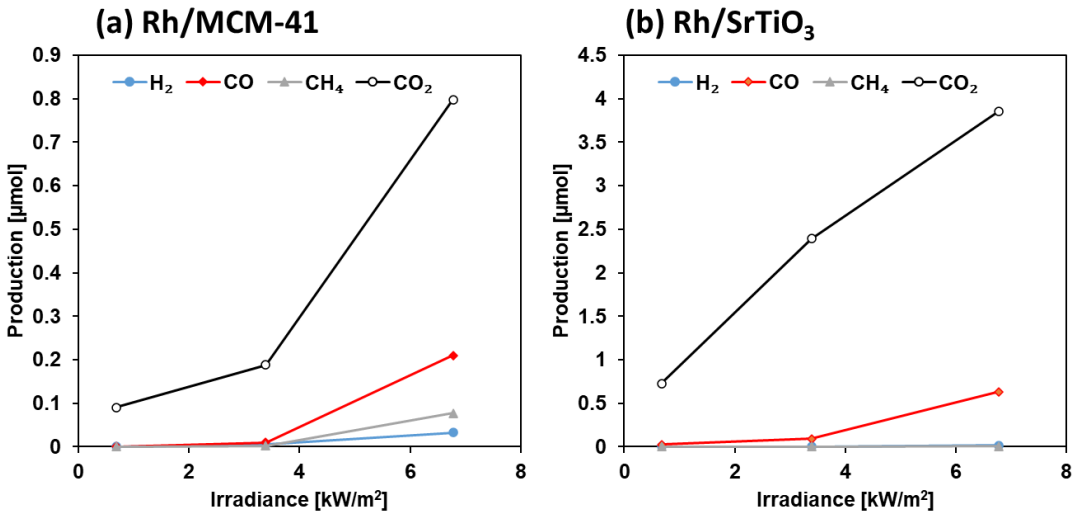

Figure S11. The amount of gas produced from C_8H_{18} degradation using Rh/MCM-41 (a) and $Rh/SrTiO_3$ (b) under different light intensities. Oxygen gas condition: $O_2/(O_2+N_2)$ = 5%.

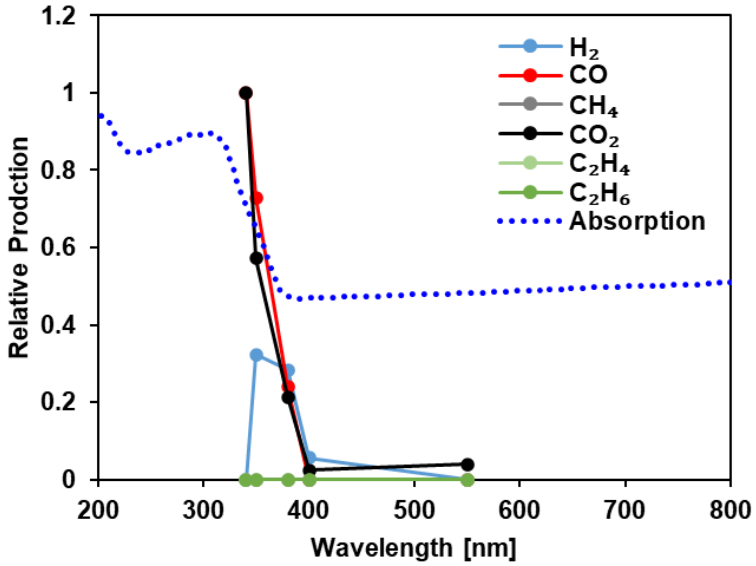

Figure S12. The action spectrum of $Rh/SrTiO_3$, where oxygen gas condition was 100%.

Table S1. (a) Temperatures of C_8H_{18} solution dispersed with catalysts under UV irradiation, and (b) surface temperatures of catalysts under UV irradiation in dried atmosphere.

(a) The temperatures of C_8H_{18} under UV irradiation measured by a thermocouple.

	Rh/MCM-41	Rh/$SrTiO_3$
Temperature [°C]	60.1	59.5

(b) The surface temperatures under UV irradiation measured by a radiative thermometer.

	Rh/MCM-41	Rh/$SrTiO_3$
1st time [°C]	137.5	157.5
2nd time [°C]	141	157
3rd time [°C]	141.5	152.5
Average [°C]	**140**	**156**