Supporting information

Oxidation of Trace Ethylene at 0 ºC over Platinum Nanoparticles Supported on Silica

Shazia S. Satter,[†,‡] Takuro Yokoya,[†,‡] Jun Hirayama,[†] Kiyotaka Nakajima,[†] and Atsushi Fukuoka[*,†]*

[†]Institute for Catalysis, Hokkaido University, Kita 21 Nishi 10, Kita-ku, Sapporo, Hokkaido 001-0021, Japan

[‡]Graduate School of Chemical Sciences and Engineering, Hokkaido University, Kita 13 Nishi 8, Kita-ku, Sapporo, Hokkaido 060-8628, Japan

Corresponding author: Atsushi Fukuoka (fukuoka@cat.hokudai.ac.jp), Tel: +81-11-706-9140, Fax: +81-11-706-9139

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was placed in FTIR spectroscope to monitor the oxidation of trace ethylene (200 ppm) over 10wt% Pt/SBA-15 at 0 ºC.

Figure S3. Ethylene conversion (A) and CO_2 yield (B) studied for varying space velocities, SV (a) 1500 mL h^{-1} g^{-1} (Pt/SBA-15 0.4 g), (b) 3000 mL h^{-1} g^{-1} (Pt/SBA-15 0.2 g) and (c) 6000 mL h^{-1} g^{-1} (Pt/SBA-15 0.1 g). Reaction condition: Pt/SBA-15 (Pt 1.8%), C_2H_4 200 ppm, O_2 20%, He balance, Flow rate 10 mL min^{-1}.

Figure S4. Blank experiment, flowing mixed gas, (O_2: 20%, N_2: 5%, He: balance) over Pt/SBA-15 at 0 °C for 300 min, followed by CO_2 formation (green diamonds) by heat treatment at 150 °C (ramp rate, 1 °C min^{-1}) under a He/N_2 (95%/5%) flow (10 mL min^{-1}). Reaction conditions: catalyst Pt/SBA-15 0.40 g (Pt 1.8 wt%), O_2 20%, N_2 5%, He balance, SV 1500 mL h^{-1} g^{-1}.

Figure S5. Moles of ethylene converted (black circles) and CO_2 formed (red diamonds) over Pt/SBA-15 at 0 °C for 300 min, followed by CO_2 formation (green diamonds) by heat treatment at 150 °C (ramp rate, 1 °C min^{-1}) under a O_2/He/N_2 flow (20%/75%/5%), (10 mL min^{-1}). Reaction conditions: catalyst Pt/SBA-15 0.40 g (Pt 1.8 wt%), C_2H_4 50 ppm, O_2 20%, N_2 5%, He balance, SV 1500 mL h^{-1} g^{-1}.

Figure S6. Time courses for ethylene conversion (black circles) and CO_2 yield (red diamonds) over Pt/SBA-15 at 25 °C. Reaction conditions: Pt/SBA-15 0.40 g (Pt 1.8 wt%), C_2H_4 50 ppm, O_2 20%, N_2 5 %, He balance, SV 1500 mL h^{-1} g^{-1}.

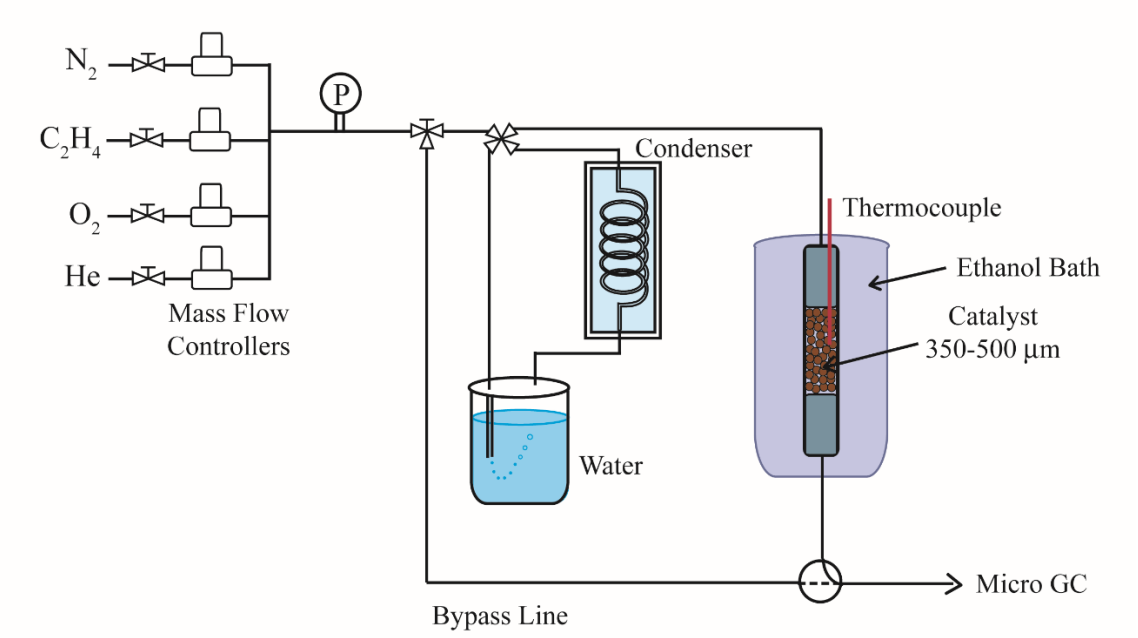


Figure S1. Schematic representation of the flow reactor used in low temperature ethylene oxidation.

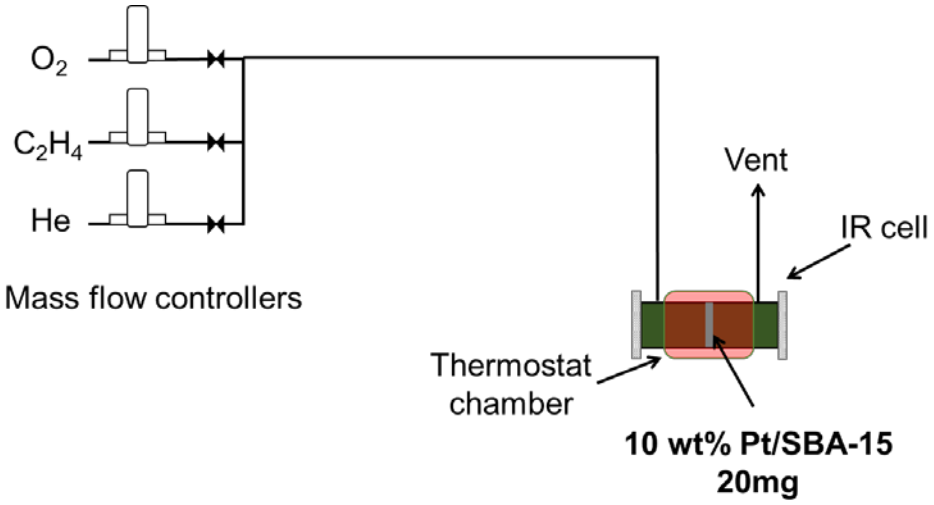
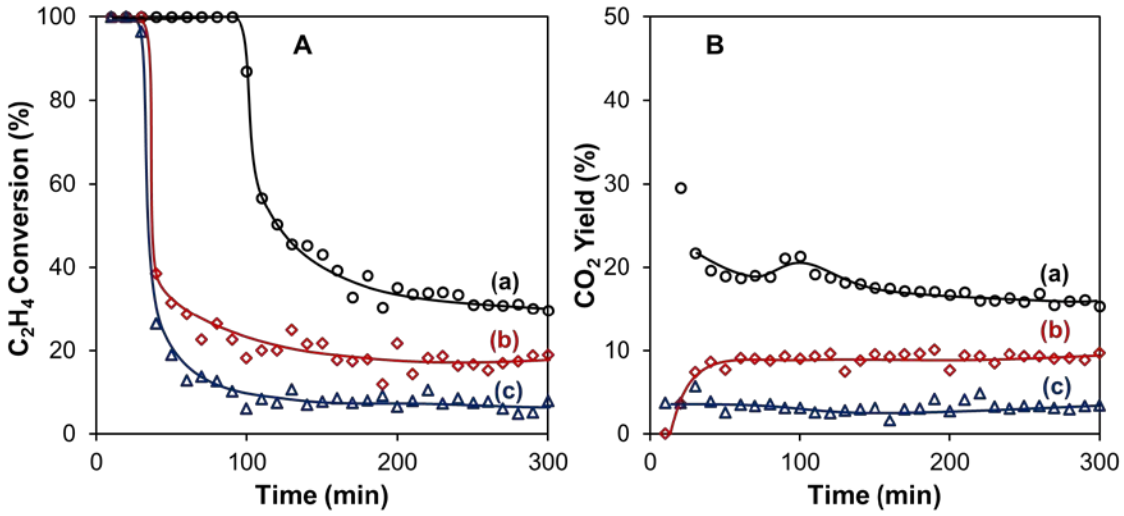


Figure S2. Schematic representation of an IR cell connected with a gas-flow system. The IR cell was placed in FTIR spectroscope to monitor the oxidation of trace ethylene (200 ppm) over 10wt% Pt/SBA-15 at 0 ºC.



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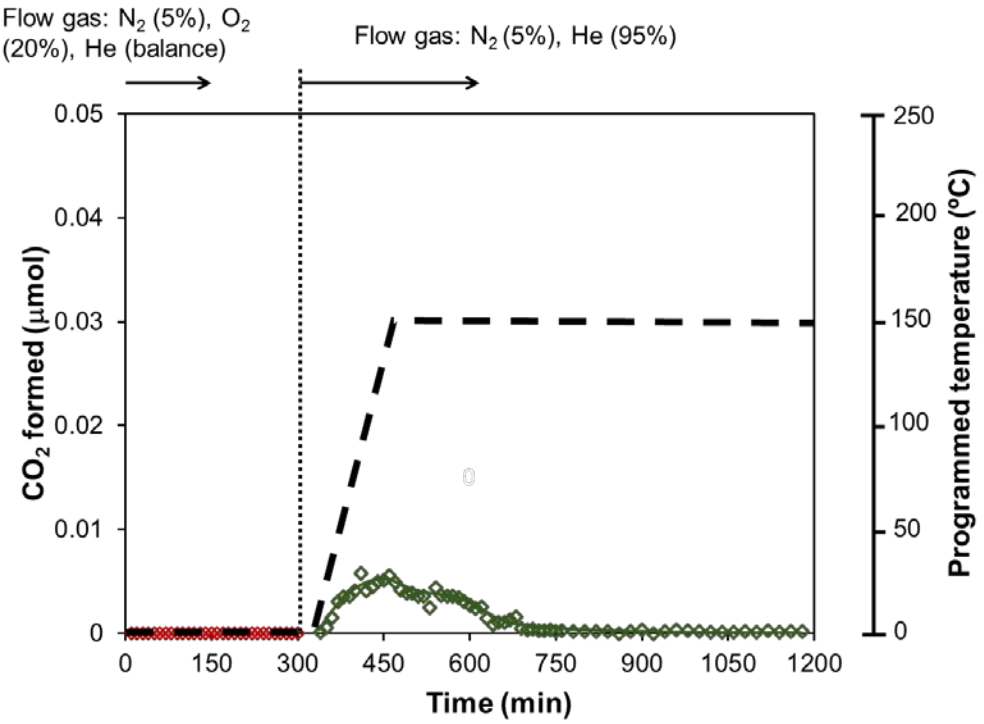

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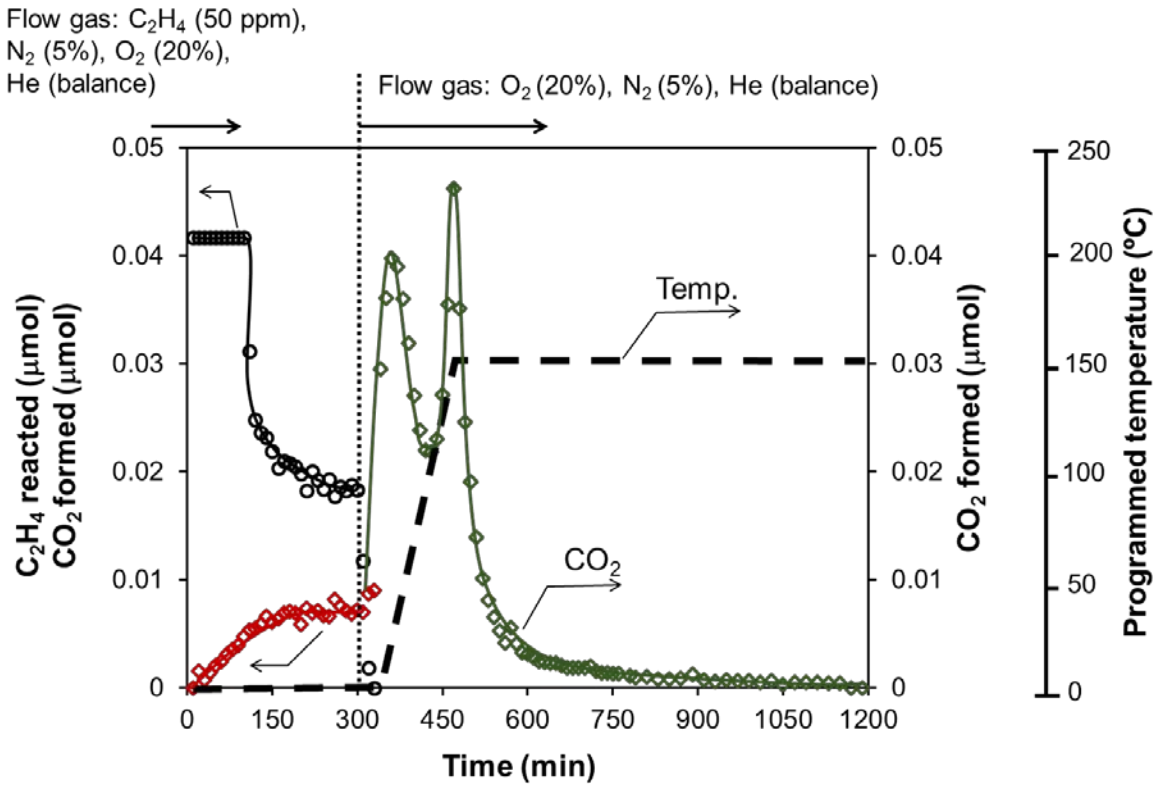

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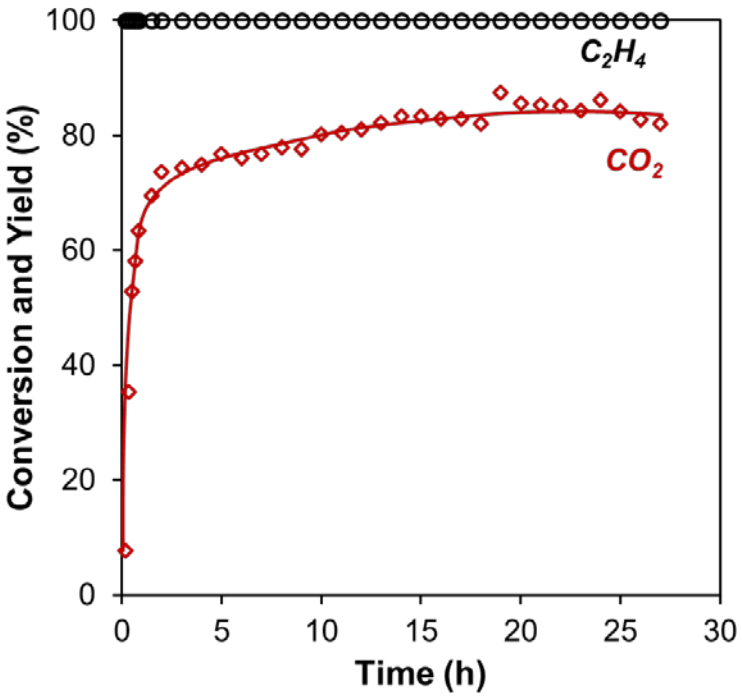

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