

Supplementary information

Comparison of catalytic properties of supported metal oxides for benzene oxidation using ozone

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1. Determination of metal oxide dispersion from TPO profiles

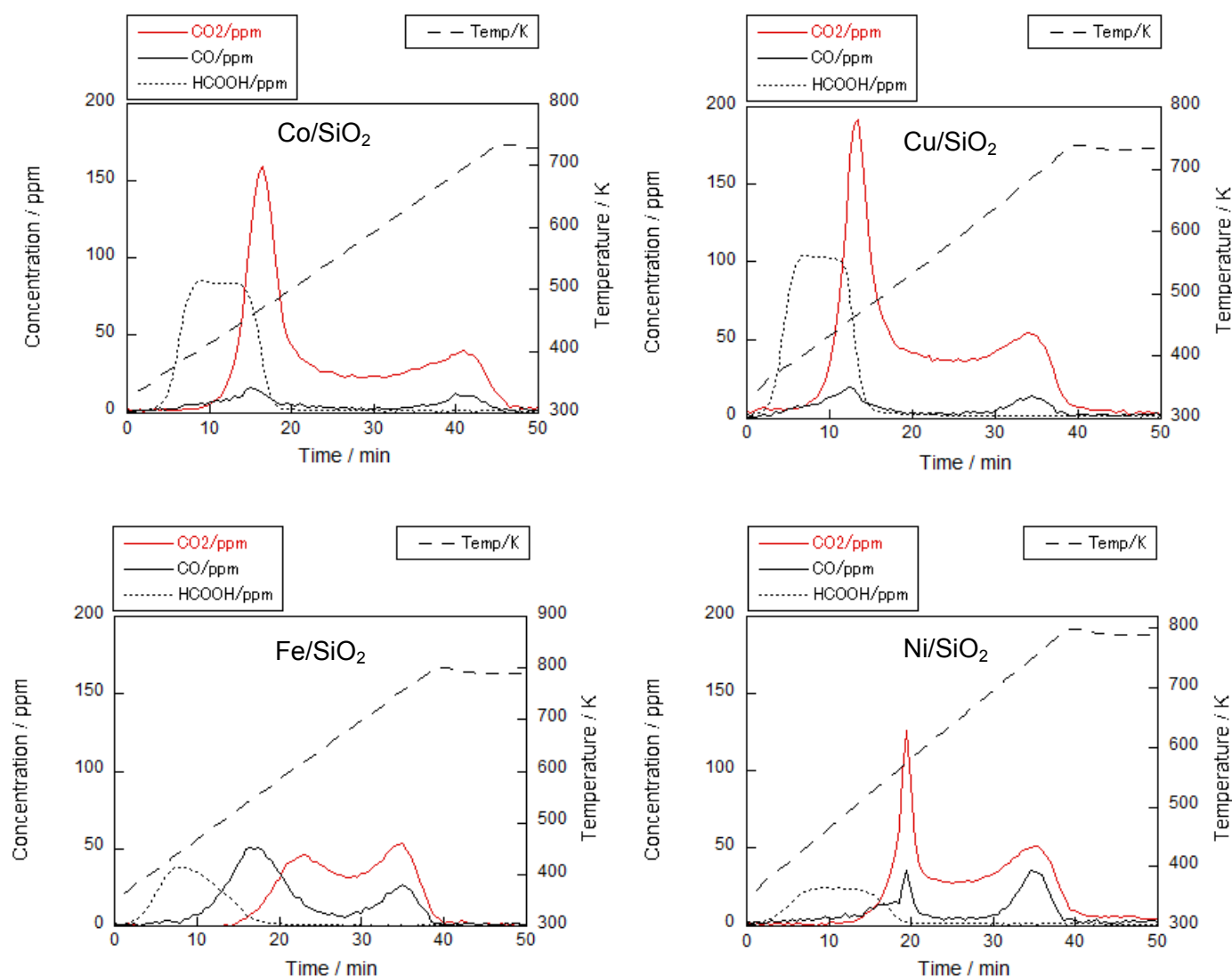


Figure S1 TPD profiles for formic acid preadsorbed on SiO₂-supported metal oxides
Catalyst weight 0.10 g, [O₂] = 10% in N₂, gas flow rate 500 mL/min.

In the estimation of metal oxide dispersion, we assumed that one molecule of formic acid

was adsorbed on an exposed metal site. This assumption therefore would underestimate the amount of the exposed metal species if one molecule of formic acid was adsorbed more than one metal site. In the present study, however, the error, if any, did not affect the consideration that Mn exhibited the highest TOF value.

2. The changes in ozone decomposition rate during catalytic ozonation of benzene.

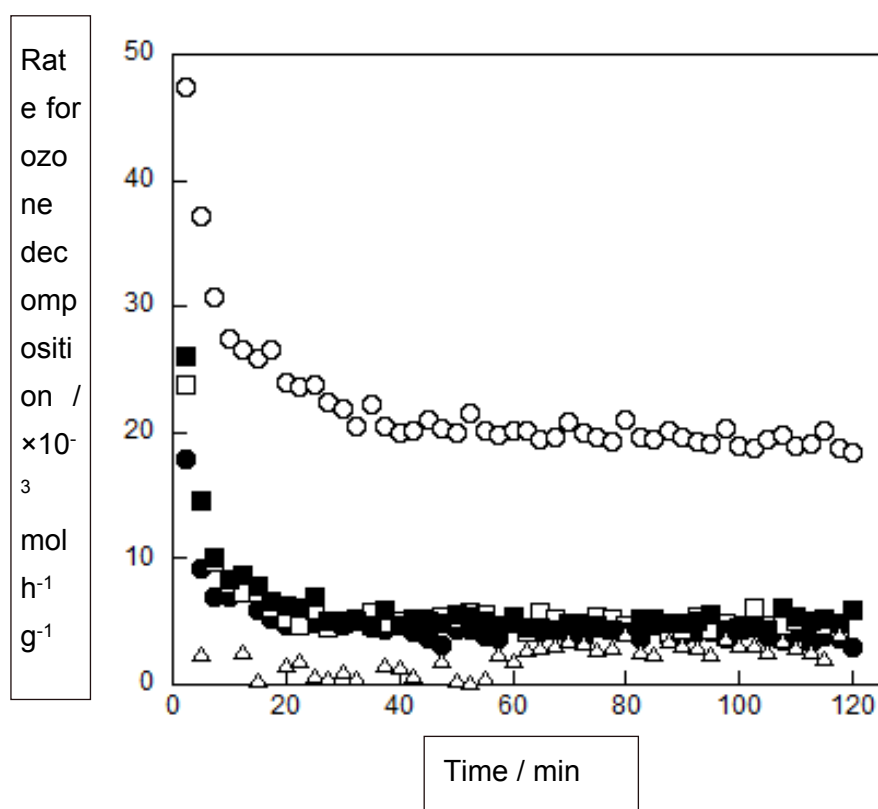


Figure S2 Time course for benzene oxidation with ozone over the SiO₂-supported metal oxides. [Benzene] = 150 ppm, [O₃] = 2250 ppm, [O₂] = 10%, temperature 343 K. (○) Mn, (△) Fe, (■) Co, (□) Ni, and (●) Cu.