

### Thermal and Catalytic pyrolysis of Citrus Peel

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In this study, thermal and ex-situ catalytic pyrolysis of citrus peel was investigated using a tandem micro reactor-GC/MS. Thermal pyrolysis at 500°C produced large amounts of oxygen containing pyrolyzates such as alcohols, ketones, and furans. The oxygen containing pyrolyzates were efficiently upgraded into value added aromatic compounds such as benzene, toluene, ethylbenzene, xylenes, naphthalene, and methyl naphthalene by applying catalytic upgrading at 600°C. Compared to wood powder, citrus peel produced the larger amounts of aromatics over HZSM-5 (SiO<sub>2</sub>/Al<sub>2</sub>O<sub>3</sub>: 23). Among various kinds of catalyst tested in this study, HZSM-5 (23) and HBETA (25) showed the highest performance for the formation of aromatic hydrocarbons. Meanwhile, HBETA (25) produced the larger amounts of polyaromatic hydrocarbons and deactivated faster than HZSM-5 (23) due to the larger amount coke formation during sequential catalytic pyrolysis reaction of citrus peel.

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