

Supporting Information

Fabrication of ultra-bright carbon nano-onions via one-step microwave pyrolysis of fish scale waste in seconds

Yunzi Xin^a, Kai Odachi^b, Takashi Shirai^{ab*}

a. Advanced Ceramics Research Center, Nagoya Institute of Technology, Gokiso-cho, Showa-ku, Nagoya, Aichi, Japan 466-8555

b. Department of Life Science and Applied Chemistry, Graduate School of Engineering, Nagoya Institute of Technology, Gokiso-cho, Showa-ku, Nagoya, Aichi, Japan 466-8555

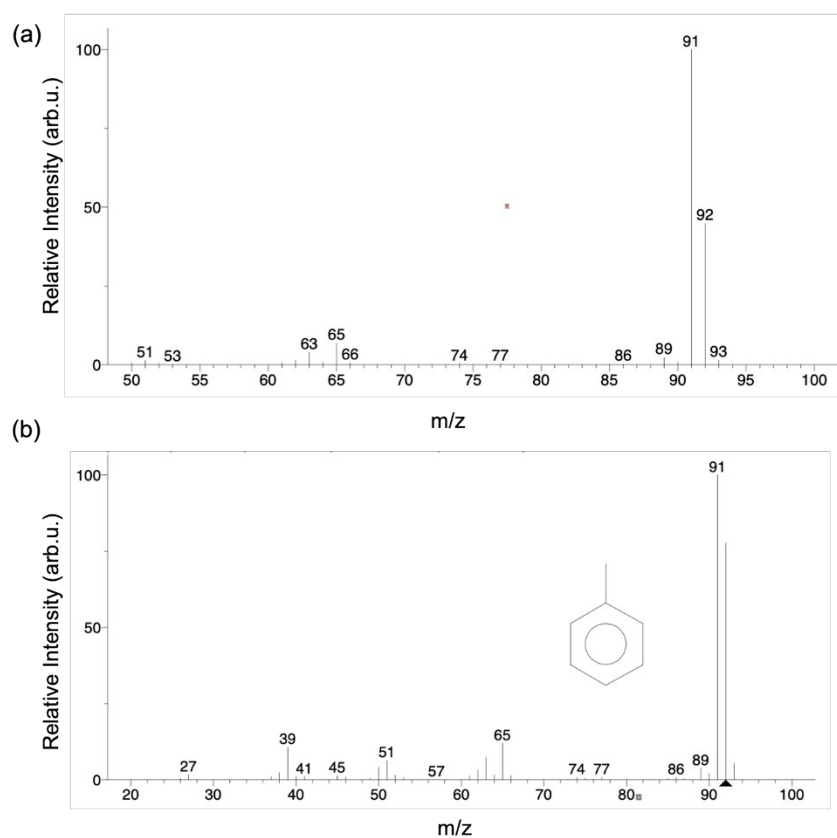


Figure S1. Mass spectrum of (a) component at t=10.304 of GC/MS result of gases generated during microwave pyrolysis and (b) toluene in database.

Upon comparing the mass spectrum of (a) the component at the retention time of 10.304 min with (b) that of toluene, the phenyl radical that appears with $m/z=91$ is significantly more abundant than the ionized one that appears in pure toluene. Therefore, the phenyl radical may have initially been involved in the gases generated during microwave pyrolysis.

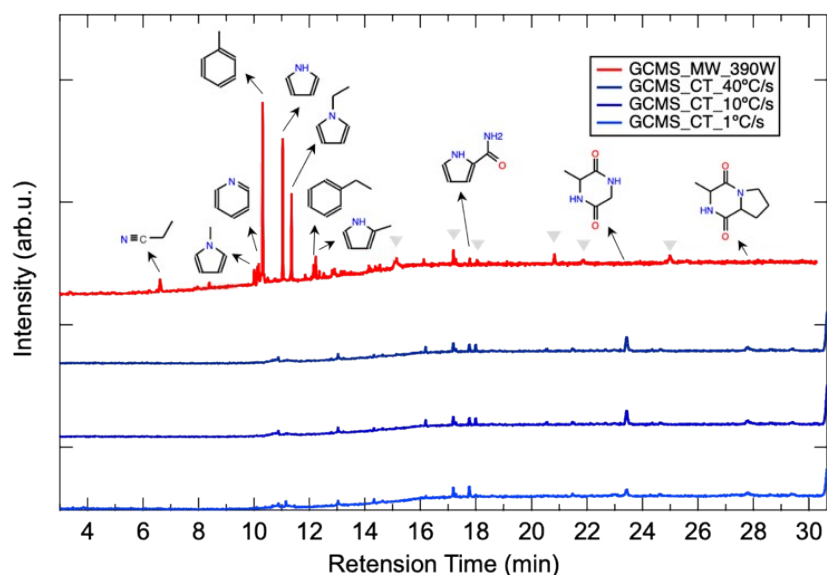


Figure S2. GC/MS spectra of gas products collected from microwave (MW) pyrolysis and conventional thermal (CT) pyrolysis (under different heating rates) of fish scale under same maximum temperature.