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## K-looping Catalytic Pyrolysis of the Original and Pelletized Biomass for In-situ Tar Reduction and Porous Carbons Production

Yafei Shen\*

Jiangsu Key Laboratory of Atmospheric Environment Monitoring and Pollution Control (AEMPC), School of Environmental Science and Engineering, Nanjing University of Information Science & Technology, Nanjing 210044, China

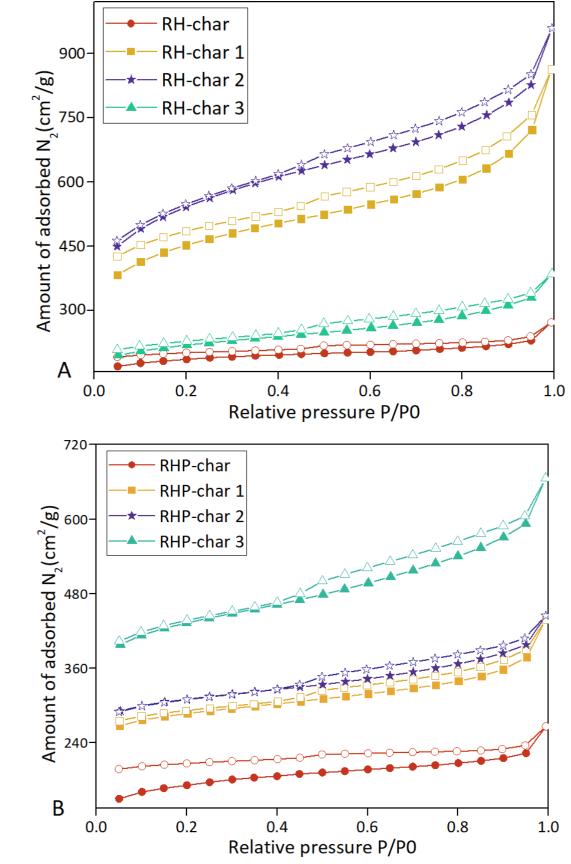


Fig. S1  $N_2$  adsorption-desorption isotherms of the RH-chars and RHP-chars

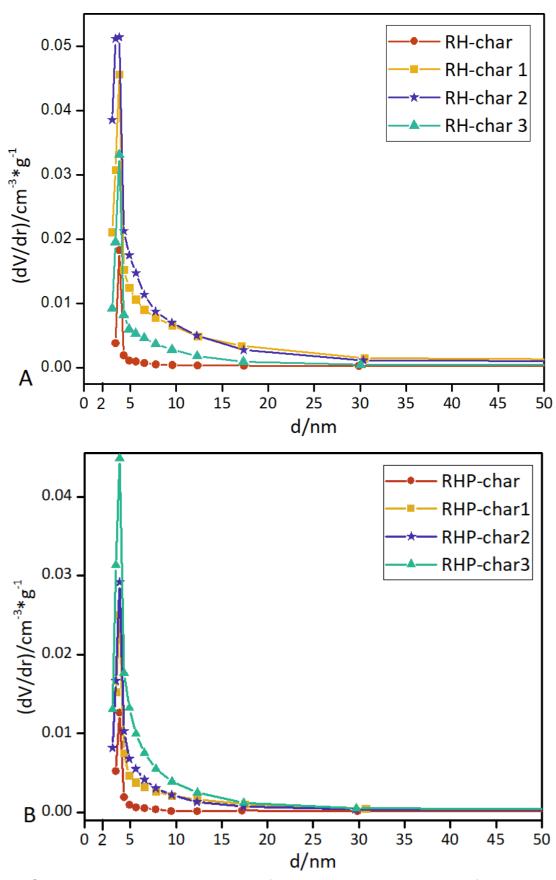


Fig. S2 Pore size distributions calculated from the desorption isotherms of the RH-chars and RHP-chars

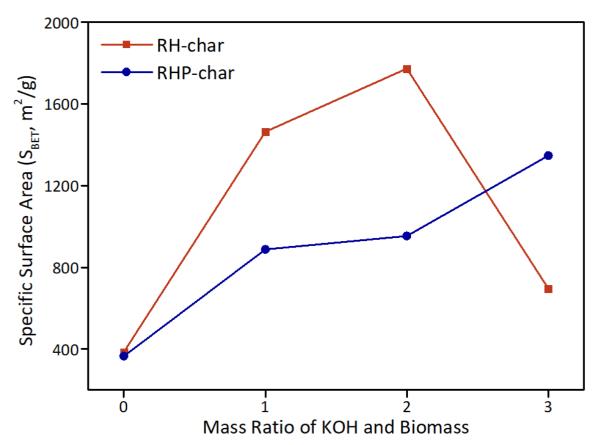


Fig. S3 Specific surface area ( $S_{\text{BET}}$ ) of RH and RHP derived chars

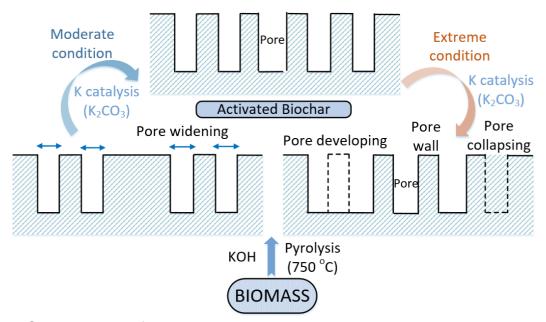


Fig. S4 Mechanism of activated biochar production via co-pyrolysis biomass with KOH

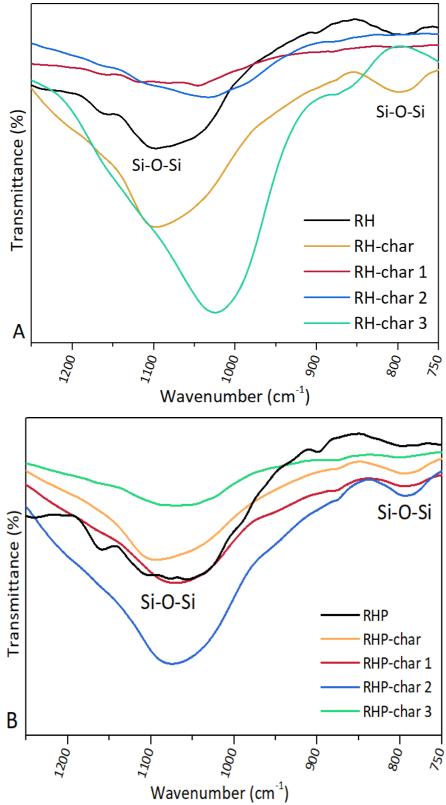


Fig. S5 IR spectrum (750-1250 cm<sup>-1</sup>) of biomass and bio-char from RH (A) and RHP (B)