

Supplementary information:

Fig. S1 The schematic diagram of the microwave-assisted pyrolysis system integrated with catalysis process

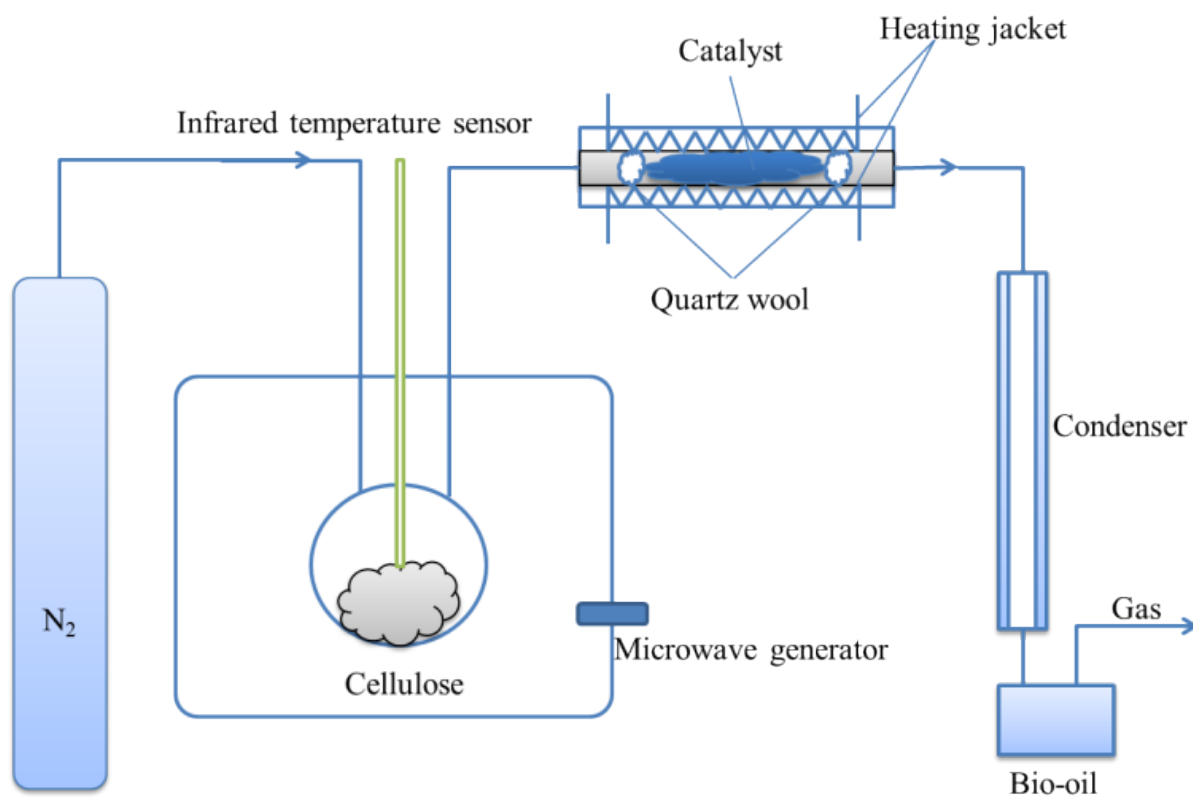


Fig. S2 NH₃-TPD profiles of ZSM-5 upon various treatments (the serial numbers correspond to those in Table 2).

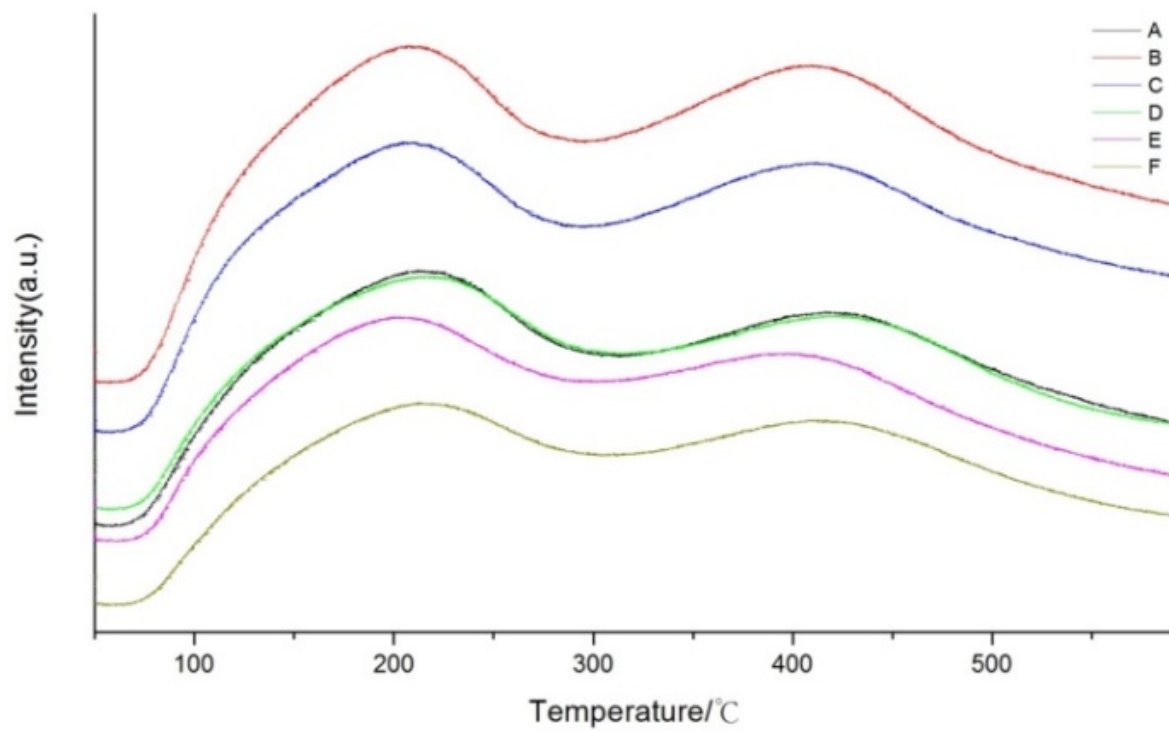


Fig. S3 The selectivity of chemical compounds in bio-oils over fresh catalyst versus spent catalyst (catalytic temperature: 500 °C; WHSV⁻¹: 0.067 h).

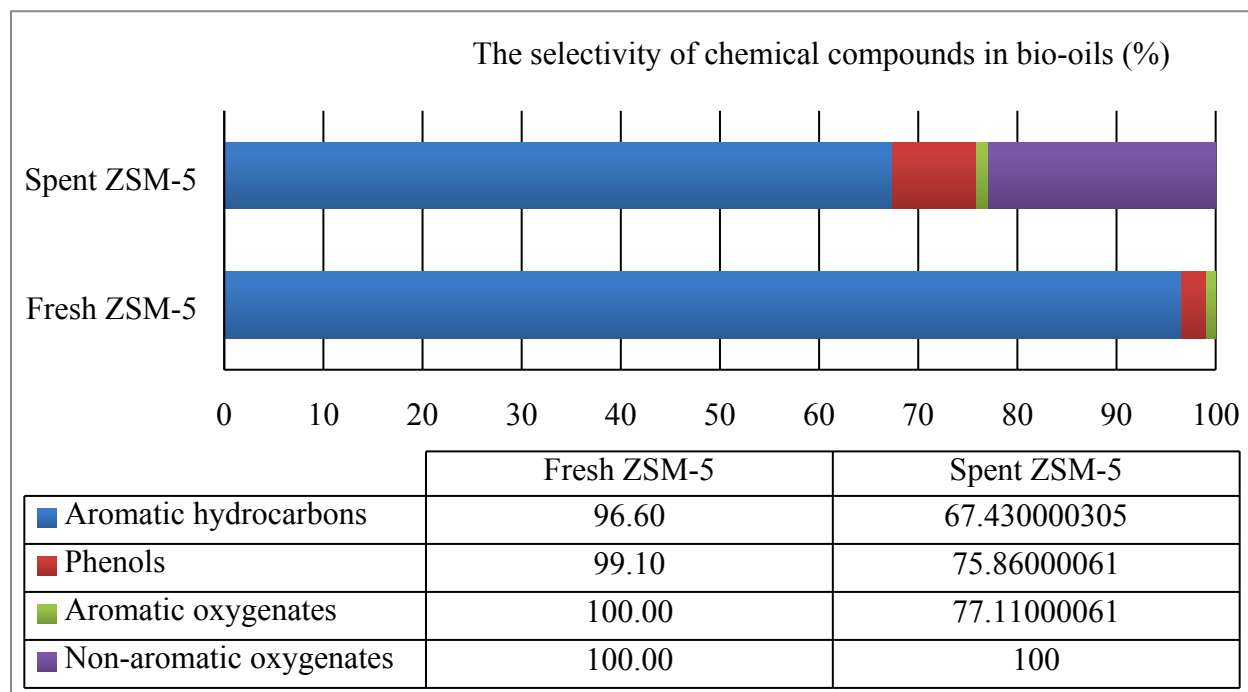


Fig. S4 The generation of mono-ring aromatic hydrocarbons in ZSM-5 framework: the catalyst consists of a local area of zeolite framework with at least one Brønsted acid site and an organic co-catalyst.

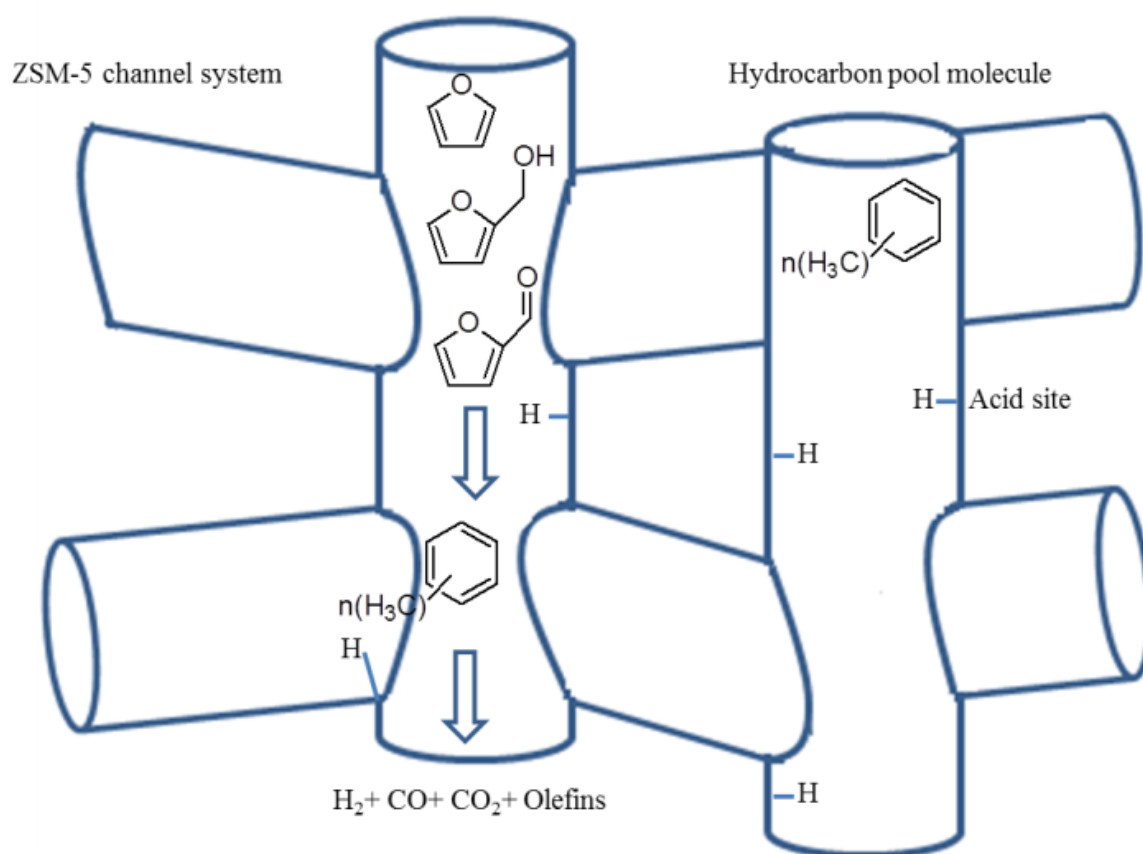


Table S1 The carbon yield of aromatic hydrocarbons as a function of catalytic temperature at WHSV⁻¹ of 0.067 h

	Catalytic temperature (°C)			
	269	375	481	500
<i>Overall yield/ C (%)</i>				
Gas	41.24	41.21	44.64	44.41
Coke	6.77	3.60	2.05	1.53
Char	30.54	31.26	29.92	29.62
Aromatics ^a	21.45	23.93	23.39	24.44
^a by difference				

Table S2 Oxygen balance of oxygenated products from catalytic pyrolysis of cellulose at the same WHSV⁻¹ of 0.067 h

	Catalytic temperature (°C)			
	269	375	481	500
<i>Overall yield/ O (%)</i>				
CO	5.56	6.01	6.36	5.87
CO ₂	44.28	50.96	54.78	56.26
H ₂ O	23.84	19.88	28.87	30.32
Coke	0.76	0.65	0.02	0.01
Char	4.76	4.80	4.66	4.70
Total	79.20	82.30	94.49	97.16