

## Supporting information

### Plasma-assisted catalytic reforming of toluene to hydrogen rich syngas

Lina Liu <sup>a,b</sup>, Qiang Wang <sup>a,b</sup>, Jianwei Song <sup>a</sup>, Shakeel Ahmad <sup>c</sup>, Xiaoyi Yang <sup>a,b</sup>, Yifei Sun <sup>b,c,\*</sup>

<sup>a</sup> School of Energy and Power Engineering, Beihang University, Beijing 100191, China

<sup>b</sup> Energy and Environment International Centre, Beihang University, Beijing, 100191, China

<sup>c</sup> Beijing Key Laboratory of Bio-inspired Energy Materials and Devices, School of Space and Environment, Beihang University, Beijing 100191, China

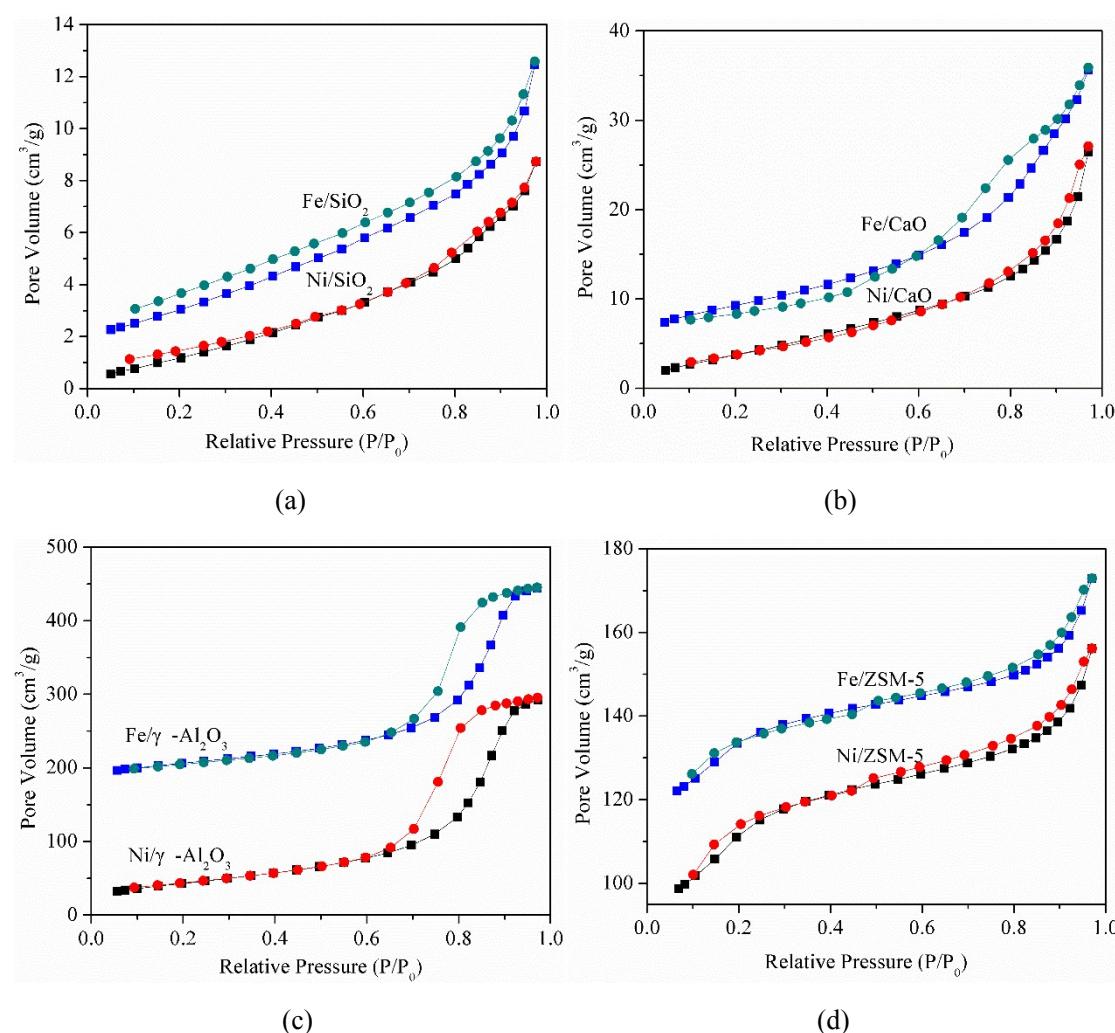


Figure S1. Adsorption isotherm of (a)  $\text{M}/\text{SiO}_2$ , (b)  $\text{M}/\text{CaO}$ , (c)  $\text{M}/\gamma\text{-Al}_2\text{O}_3$  and (d)  $\text{M}/\text{ZSM-5}$ . ( $\text{M}$ :  $\text{Ni}$  or  $\text{Fe}$ , the square line represents the adsorption line, and the dotted line the desorption line)

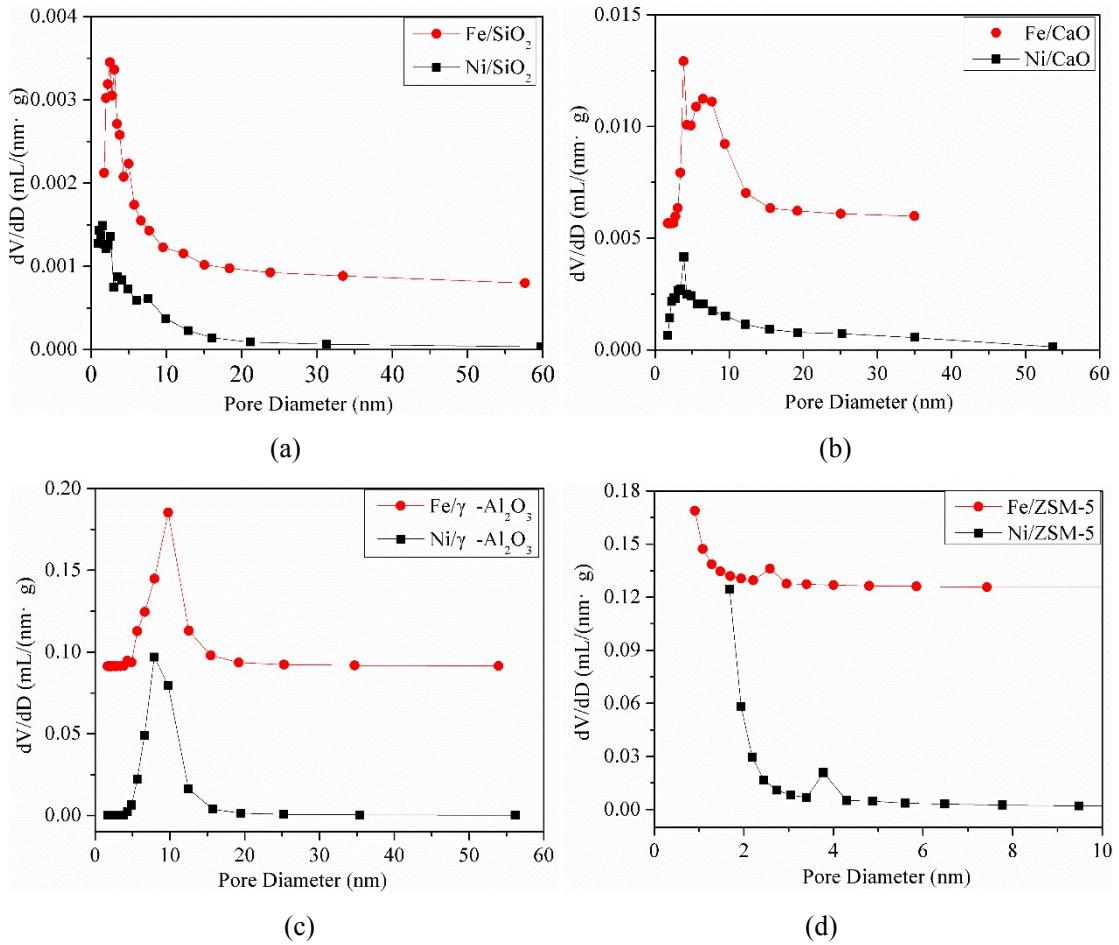


Figure S2. Pore diameter distribution of (a) M/SiO<sub>2</sub>, (b) M/CaO, (c) M/γ-Al<sub>2</sub>O<sub>3</sub> and (d) M/ZSM-5  
(M: Ni, Fe).

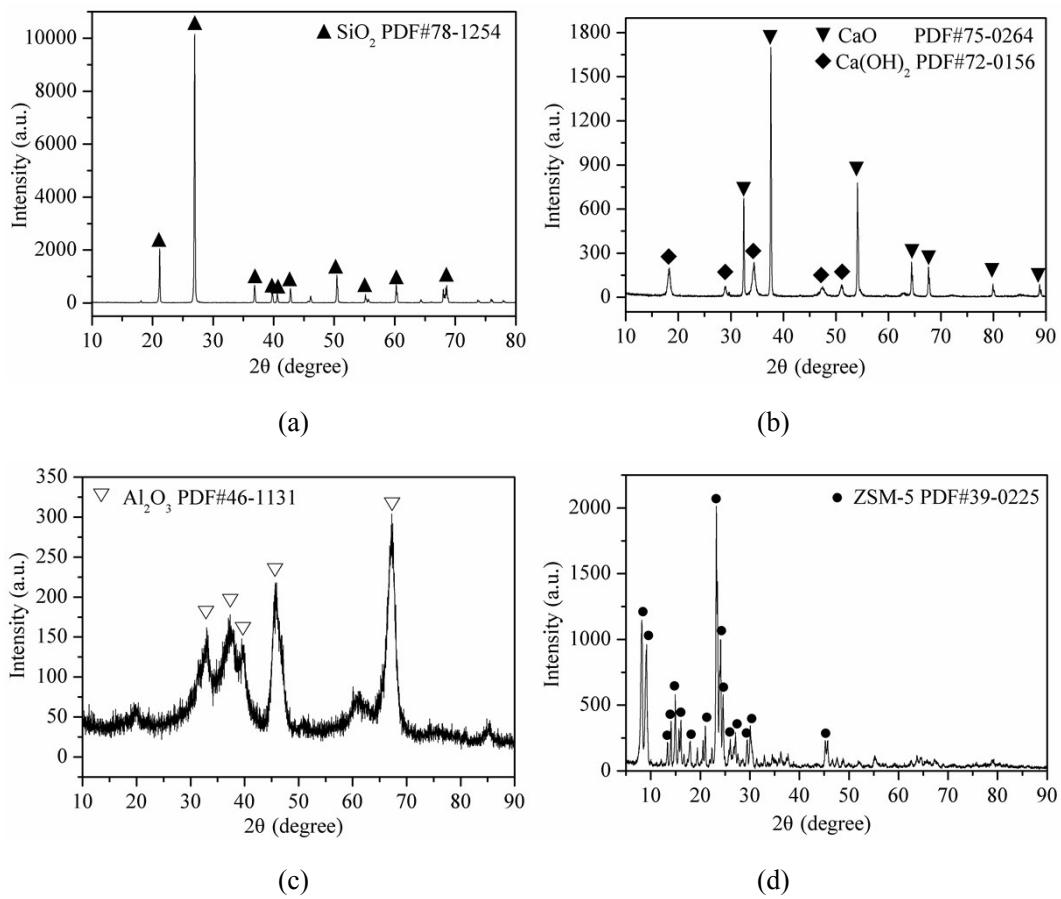


Figure S3. XRD patterns of different support materials: (a)  $\text{SiO}_2$ , (b)  $\text{CaO}$ , (c)  $\gamma\text{-Al}_2\text{O}_3$  and (d) ZSM-5.

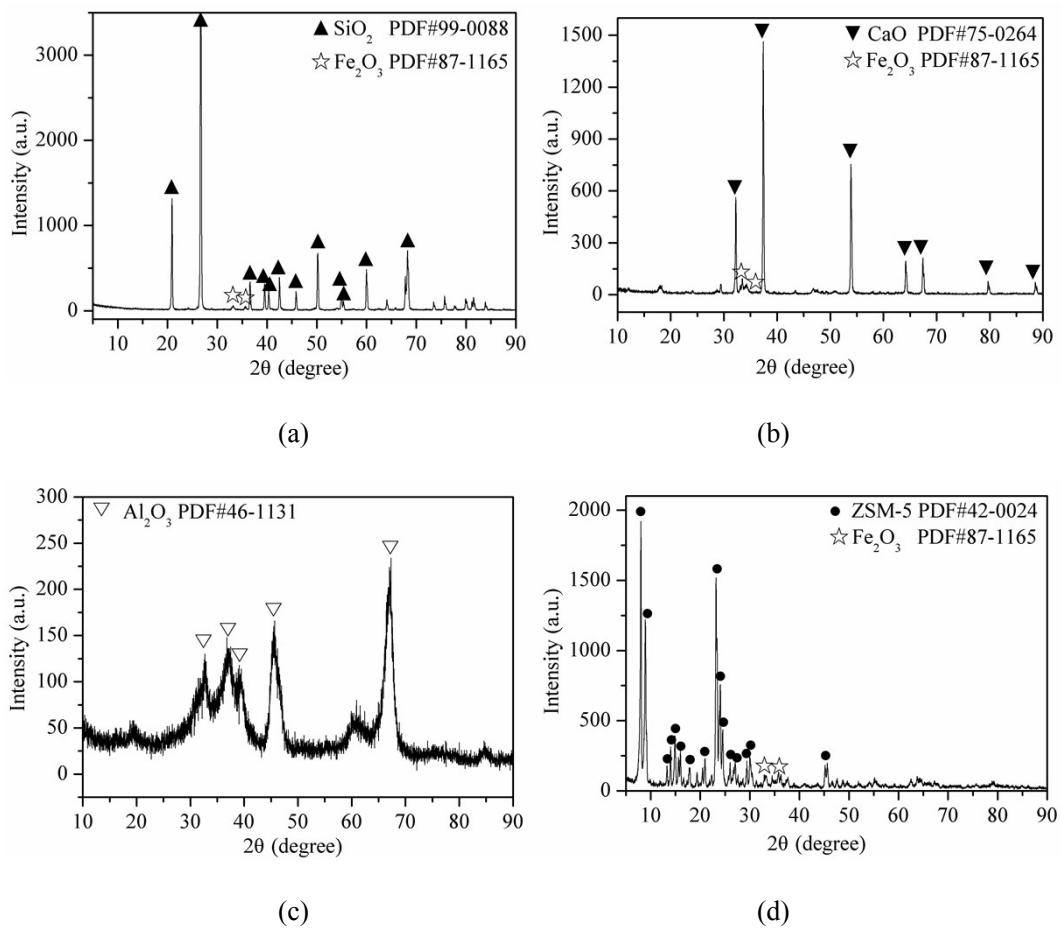


Figure S4. XRD patterns of the calcined (a) Fe/SiO<sub>2</sub>, (b) Fe/CaO, (c) Fe/γ-Al<sub>2</sub>O<sub>3</sub> and (d) Fe/ZSM-5.

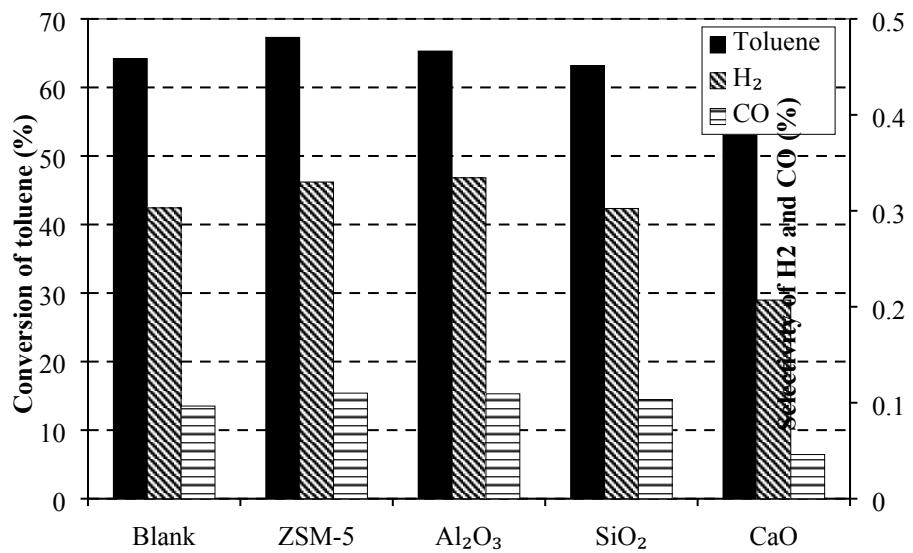


Figure S5. Conversion of toluene and selectivity of H<sub>2</sub> and CO catalyzed by different supports during toluene reforming in the post-plasma catalysis system.