

**Electronic Supplementary Information (ESI) for:**

**Ultrafine nanoporous PdFe/Fe<sub>3</sub>O<sub>4</sub> catalysts with doubly enhanced activities  
towards electro-oxidation of methanol and ethanol in alkaline media**

Zhonghua Zhang,\* Chi Zhang, Junzhe Sun, Tianyi Kou, Qingguo Bai, Yuan Wang, and Yi Ding

*Key Laboratory for Liquid-Solid Structural Evolution and Processing of Materials (Ministry of Education), School of Materials Science and Engineering, Center for Advanced Energy Materials and Technology Research, Shandong University, Jingshi Road 17923, Jinan, 250061, P.R. China.*

\*Corresponding author. Email: [zh\\_zhang@sdu.edu.cn](mailto:zh_zhang@sdu.edu.cn)

Table S1. Real chemical compositions of the np-PdFe samples obtained by dealloying the rapidly solidified Al-Pd-Fe precursor alloys in the 20 wt.% NaOH solution.

Samples	Pd (at.%)	Fe (at.%)	Al (at.%)
np-PdFe-1	31.0	60.1	8.9
np-PdFe-2	39.0	53.6	7.4
np-PdFe-3	44.5	46.3	9.2
np-PdFe-4	55.6	34.8	9.6
np-PdFe-5	62.9	28.4	8.7

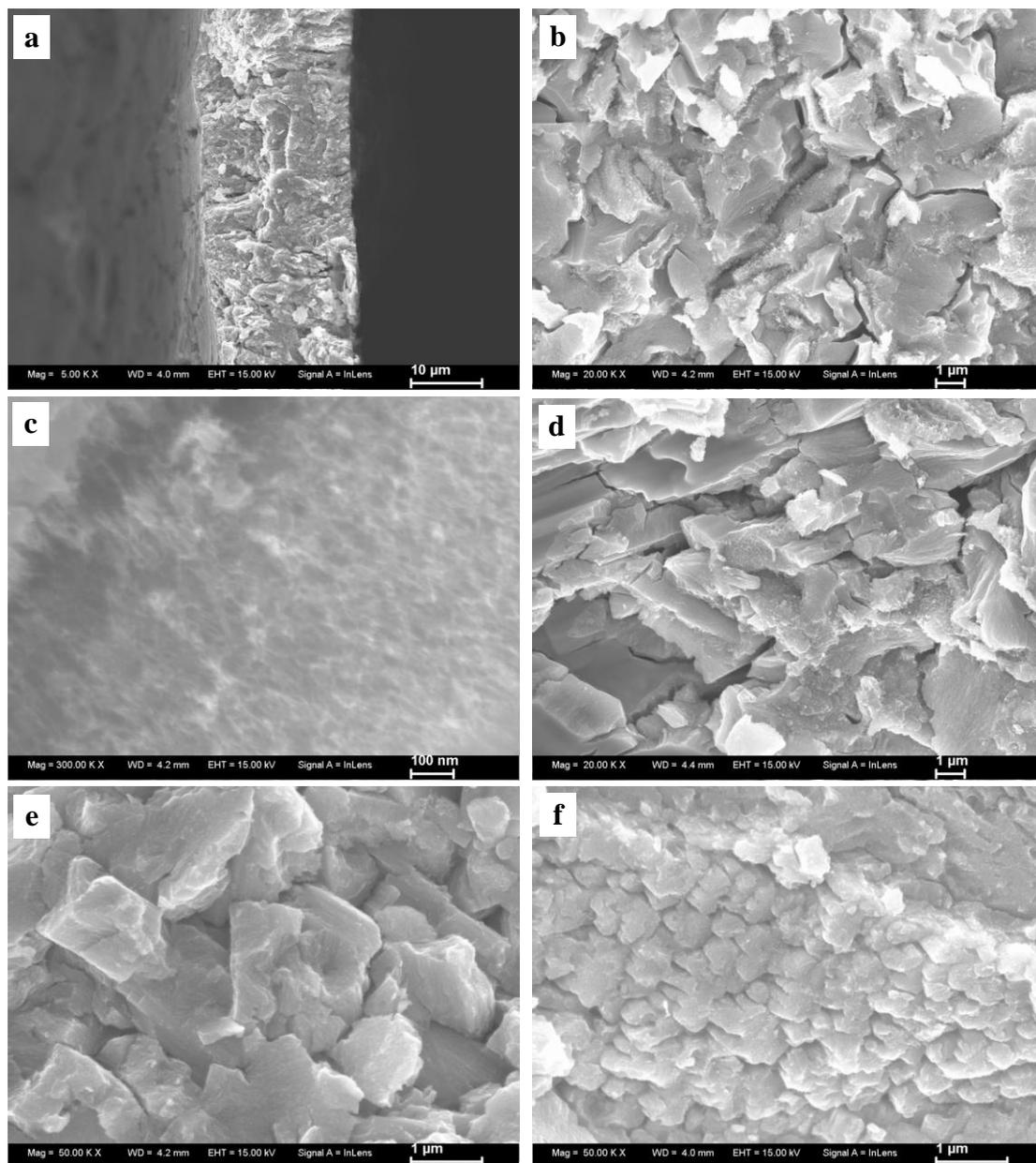


Figure S1. Section-view SEM images showing the microstructure of the np-PdFe (a: np-PdFe-1; b,c: np-PdFe-2; d: np-PdFe-3; e: np-PdFe-4; f: np-PdFe-5) samples obtained by dealloying the rapidly solidified Al-Pd-Fe precursor alloys in the 20 wt.% NaOH solution.

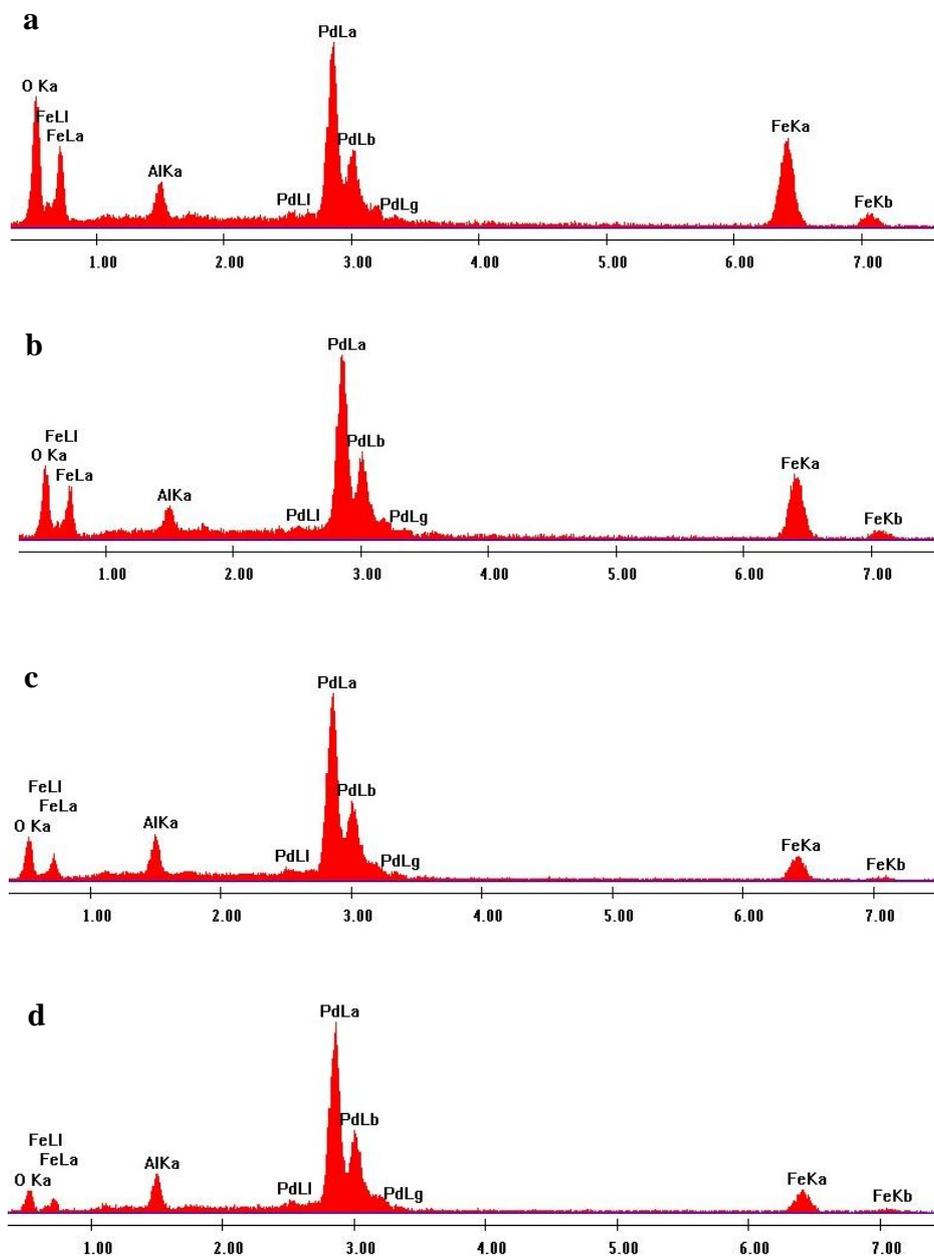


Figure S2. EDX spectra of the np-PdFe (a: np-PdFe-1; b: np-PdFe-2; c: np-PdFe-4; d: np-PdFe-5) samples obtained by dealloying the rapidly solidified Al-Pd-Fe precursor alloys in the 20 wt.% NaOH solution.

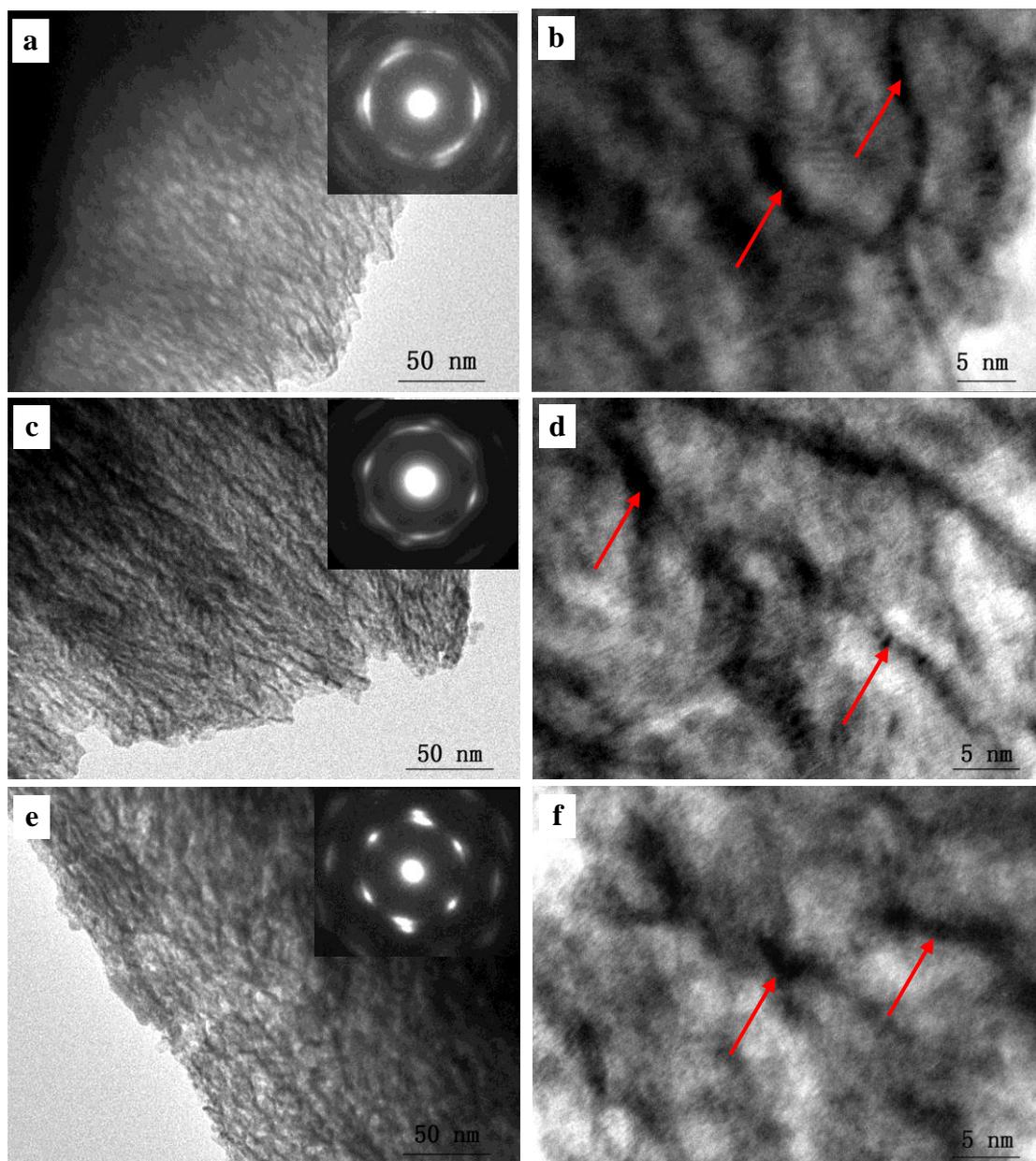


Figure S3. a,c,e) TEM and b,d,f) HRTEM images showing the nanoporous structure of a,b) np-PdFe-2, c,d) np-PdFe-3 and e,f) np-PdFe-4 obtained by dealloying the rapidly solidified  $\text{Al}_{75}\text{Pd}_{10}\text{Fe}_{15}$ ,  $\text{Al}_{75}\text{Pd}_{12.5}\text{Fe}_{12.5}$  and  $\text{Al}_{75}\text{Pd}_{15}\text{Fe}_{10}$  alloys in the 20 wt.% NaOH solution, respectively. Insets in a,c,e) Corresponding SAED patterns. Some ligaments are highlighted by solid arrows in b,d,f).