Functional Control Engineering of Coal Gangue Electrocatalyst with Amorphous SiC_X/SiO_X Active Layer Loading Enables Efficient Li-O_2 Batteries

Zhihui Sun, Nan Zhou *, Meng Li, Jianfei Xu, Wenchang Feng and Shuo Liu

School of Mines, China University of Mining and Technology, Xuzhou 221116, China
* Correspondence: 5724@cumt.edu.cn

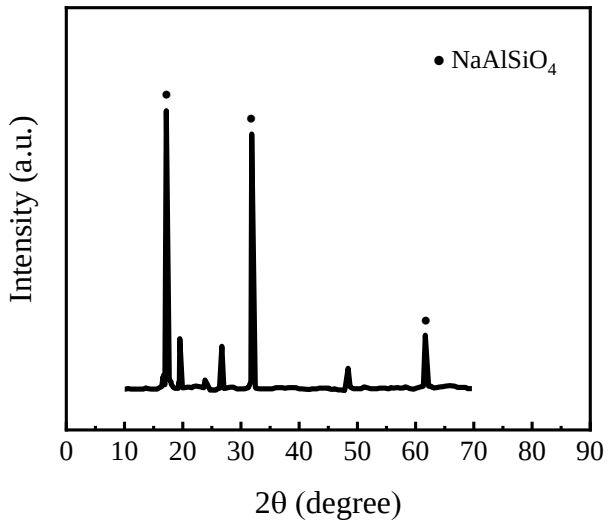


Figure S1. XRD patterns of the intermediate products.

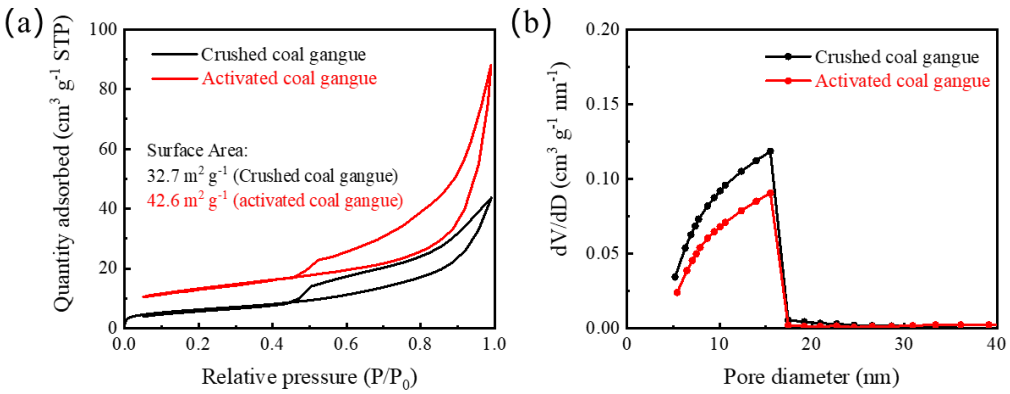


Figure. S2. N_2 adsorption-desorption isotherms (a) and pore size distributions (b) of as-prepared samples.

Table S1. The atomic content of each element for activated coal gangue and crushed coal gangue from XPS.

Material	C (atomic %)	Si (atomic %)	O (atomic %)	Al (atomic %)	N (atomic %)	Si/C	Si/O
Crushed coal gangue	18.8	15.4	54.9	9.9	1.0	0.81	0.28
Activated coal gangue	26.7	24.5	36.1	0.1	12.6	0.91	0.68

Table S2. Comparison of battery performance of activated coal gangue-based electrode with other reported electrodes

Material	Current density	First discharge capacity	Cycling current density	Cycle number	Cycle time	Limited capacity	Rf.
CNT@Ni@NiCo silicate	200 mA g^{-1}	10046 mAh g^{-1}	150 mA g^{-1}	54	\	1000 mAh g^{-1}	[1]
V-TiO_2/Ti_3C_2Tx	100 mA g^{-1}	11 487 mAh g^{-1}	100 mA g^{-1}	200	\	1000 mAh g^{-1}	[2]
MoO_2/Mo_2C@RGO	100 mA g^{-1}	2365 mAh g^{-1}	200 mA g^{-1}	100	\	1000 mAh g^{-1}	[3]
MoO_2 NPs/CTs	0.2 mA cm^{-2}	9.3 mAh cm^{-2}	0.2 mA cm^{-2}	240	\	0.4 mA cm^{-2}	[4]
$MnCo_2O_4$/MoO_2@Ni	200 mA g^{-1}	4210 mAh g^{-1}	500 mA g^{-1}	400		1000 mAh g^{-1}	[5]
Activated coal gangue	100 mA g^{-1}	9156 mAh g^{-1}	200 mA g^{-1}	\	380 h	1000 mAh g^{-1}	This work

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