

# **Insight into the Dispersion Behavior of 1-butyl-3-methylimidazolium chloride Confined in Nanoscale pores of Carbon Materials**

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## **Supporting Information**

**Table S1** XPS atomic semi-quantitative of carbon materials and SILP materials after washed

Sample	The semi-quantitative of surface element (%)			
	C	O	N	Cl
AC-n	90.58	8.07	1.31	0.04
AC-n-N500	90.76	7.97	1.23	0.04
AC-n-N900	92.08	6.30	1.58	0.05
AC-n-10%IL(washed)	90.53	7.97	1.37	0.11
AC-n-N500-10%IL(washed)	91.06	7.41	1.41	0.12
AC-n-N900-10%IL(washed)	92.02	6.10	1.72	0.16

These semi-quantitative of C, O, N, Cl are listed in Table 1. It can be seen that the amount of oxygen atomic on the surface of AC-n decreased by thermal treatment temperature, which was consistent with the results of TPD measurement. Further, the amount of chlorine atomic on these three washed SILP materials was: 0.11%、0.12%、0.16%. This tendency was consistent with weighing method.

**Table S2** Amount (A) and Decomposing Temperatures (T) of Different surface oxygenated groups and the Total Amount of surface oxygenated groups (Obtained by the Deconvolution of CO<sub>2</sub>-TPD Curves)

Sample	carboxyl		carboxylic anhydride		peroxide		lactone1		lactone2		Total A
	A	T	A	T	A	T	A	T	A	T	
AC-n	81	273	200.6	410	2.91	615	11.93	687	5.24	817	301.3
AC-n-N500	29.95	310	26.2	490	1.35	538	31.45	617	14.25	780	103.2
AC-n-N900	/	/	/	/	/	/	/	/	/	/	/

<sup>a</sup>The amount of surface oxygenated groups with the unit of  $\mu\text{mol/g}$ ;

<sup>b</sup>The decomposing temperature with the unit of  $^{\circ}\text{C}$ ; (It is similarly hereinafter if there is no additional description.)

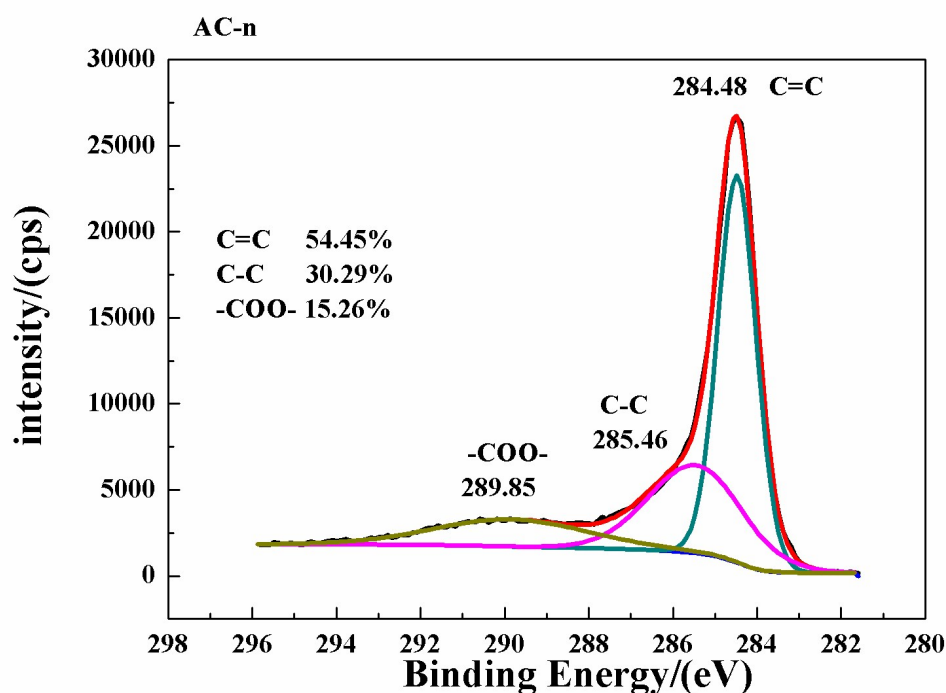
<sup>c</sup>There is no such surface oxygenated group present on activated carbon according to the result of deconvolution.

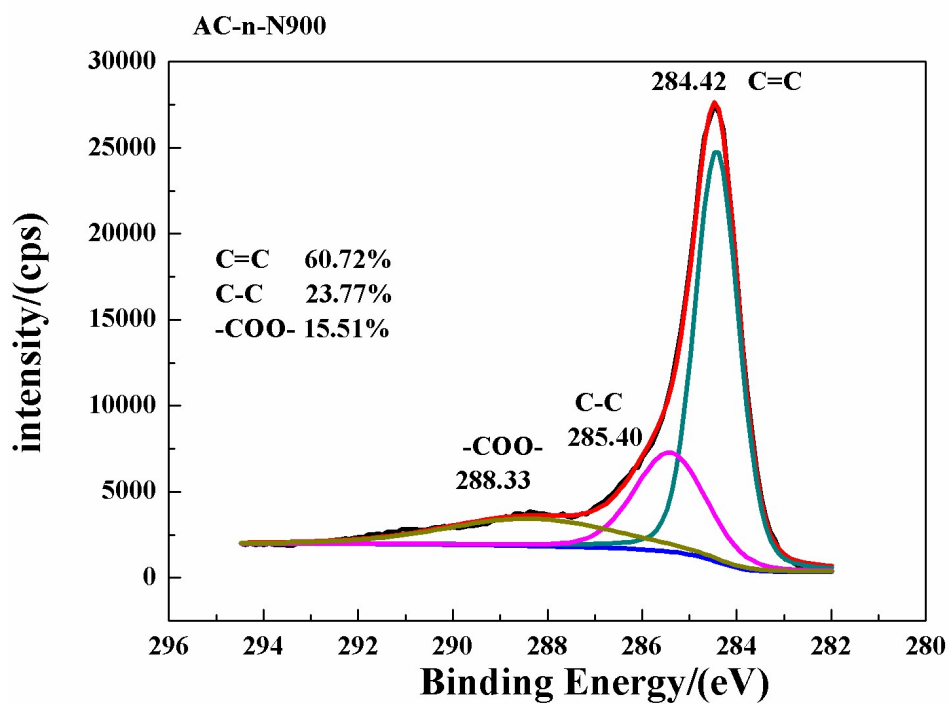
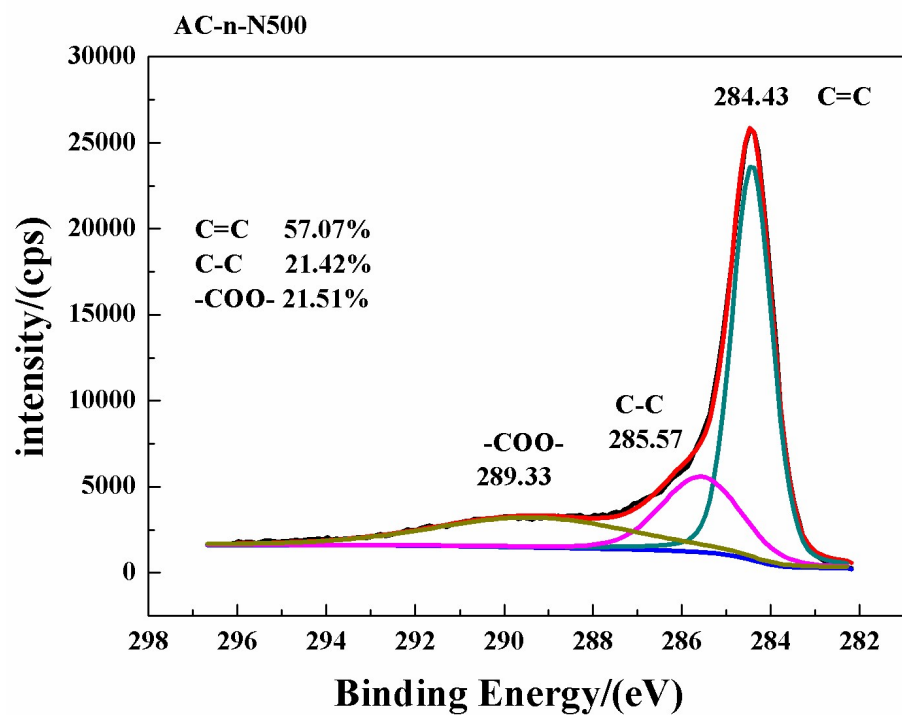
**Table S3** Amount (A) and Decomposing Temperatures (T) of Different oxygenated groups and the Total Amount of oxygenated groups (Obtained by the Deconvolution of CO-TPD Curves)

Sample	Adsorptive CO		Carboxylic anhydride		phenol		ether		carbonyl		Total A
	A	T	A	T	A	T	A	T	A	T	
	AC-n	12.79	281	125.72	517	191.79	675	63.82	745	199.18	
AC-n-N500	/	/	47.1	541	173.3	657	118.9	726	347.2	840	686.5
AC-n-N900	/	/	/	/	89.3	652	31.2	769	34.7	875	155.2

<sup>a</sup>There is no such surface oxygenated group present on activated carbon according to the result of deconvolution.

The amount and decomposing temperature of different surface oxygenated groups and the total amount of surface oxygenated groups, obtained by the deconvolution of CO<sub>2</sub> and CO TPD curves, were summarized in **Table S2** and **Table S3**.





**Figure S1** High resolution XPS spectra of C1s peak for AC-n, AC-n-N500, AC-n-N900