Electronic Supplementary Information

New insights into the interactions of phenol with oxygenated functional groups on curved fullerene-like sheets in activated carbon

Chun-Yang Yin, ^{*a*,§,*} Man-Fai Ng, ^{*b*,§,*} Bee-Min Goh ^{*c*}, Martin Saunders, ^{*d*} Nick Hill, ^{*a*} Zhong-Tao Jiang, ^{*e*} Juan Balach, ^{*f*} Mohanad El-Harbawi, ^{*g*}

^a School of Science and Engineering, Teesside University, Borough Road, Middlesbrough, TS1 3BA, United Kingdom

^b Institute of High Performance Computing, Agency for Science, Technology and Research, 1 Fusionopolis Way, #16-16 Connexis, Singapore 138632, Singapore

^c School of Chemical Engineering and Advanced Materials, Newcastle University, NE1 7RU, United Kingdom

^d Centre for Microscopy, Characterisation and Analysis (CMCA), The University of Western Australia (M010), 35 Stirling Highway, Crawley WA 6009, Australia

^eSurface Analysis and Materials Engineering Research Group, School of Engineering & Information Technology, Murdoch University, Murdoch, Western Australia 6150, Australia

^fLeibniz Institute for Solid State and Materials Research (IFW) Dresden, Institute for Complex Materials, Helmholtzstraße 20, D-01069 Dresden, Germany

^g Chemical Engineering Department, King Saud University, Riyadh 11421, Saudi Arabia

Keywords: Activated carbon; density functional theory; transmission electron microscopy; phenol adsorption; oxygenated functional groups

Table S1. Comparison of the effects of basis sets: 6-31G(d,p) and 6-311G**. No zero-point energy corrections are applied for these testing calculations.

	Phenol Adsorption Site	Adsorption Energy in Water (kcal/mol) using 6-31G(d,p)	Adsorption Energy in Water (kcal/mol) using 6-311G**
1	Virgin carbon sheet	-27.41	-29.35
2	Carbon sheet with	-27.79	-29.48
	2×COOH on plane		
8	COOH on carbon sheet	-19.83	-20.09