Electronic Supplementary Material (ESI) for RSC Advances.

Rapid, In-Situ Plasma Functionalization of Carbon Nanotubes for Improved CNT/Epoxy Composites

Rachit Malik[1], Colin McConnell[2], Noe T. Alvarez[2], Mark Haase[2], Seyram Gbordzoe[1], Vesselin Shanov[1,2]*

[1]Department of Mechanical & Materials Engineering, University of Cincinnati, Cincinnati, OH, USA.

[2]Department of Biomedical, Chemical and Environmental Engineering, University of Cincinnati, Cincinnati, OH, USA.

*Corresponding author, e-mail: shanovvn@ucmail.uc.edu.

Electronic Supplementary Information (ESI)

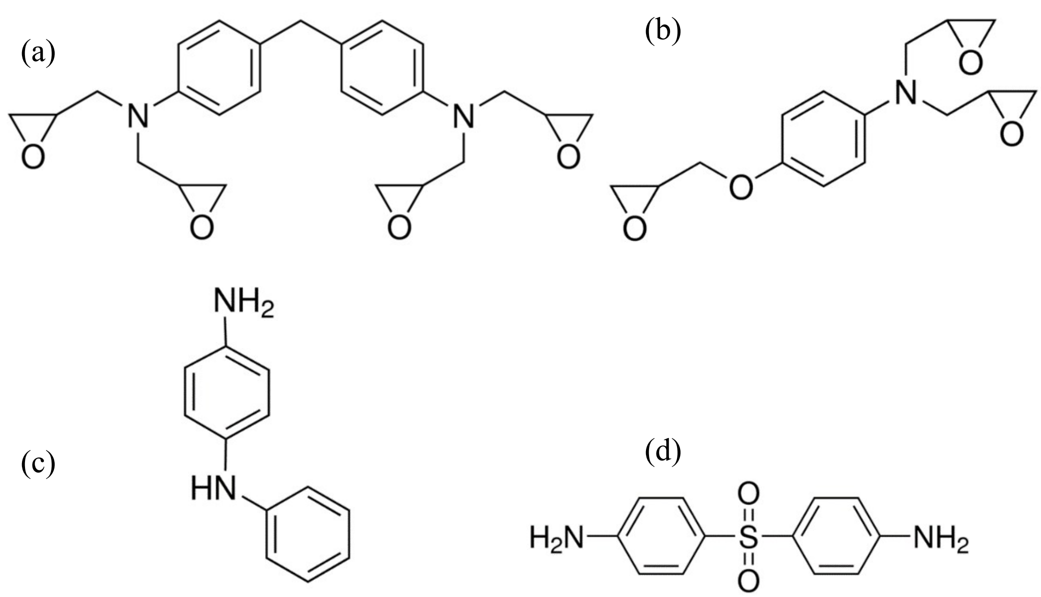

Figure S1: The epoxy resin used in this study is composed of a mixture of two epoxide compounds: (a) – 4,4-Methylenebis (N, N-diglycidylaniline); (b) – N, N-Diglycidyl-4-glycidyloxyaniline plus a combination of proprietary aromatic curing agents such as (c) – N-phenyl-p-phenylenediamine; (d) – 4-Aminophenyl sulfone.

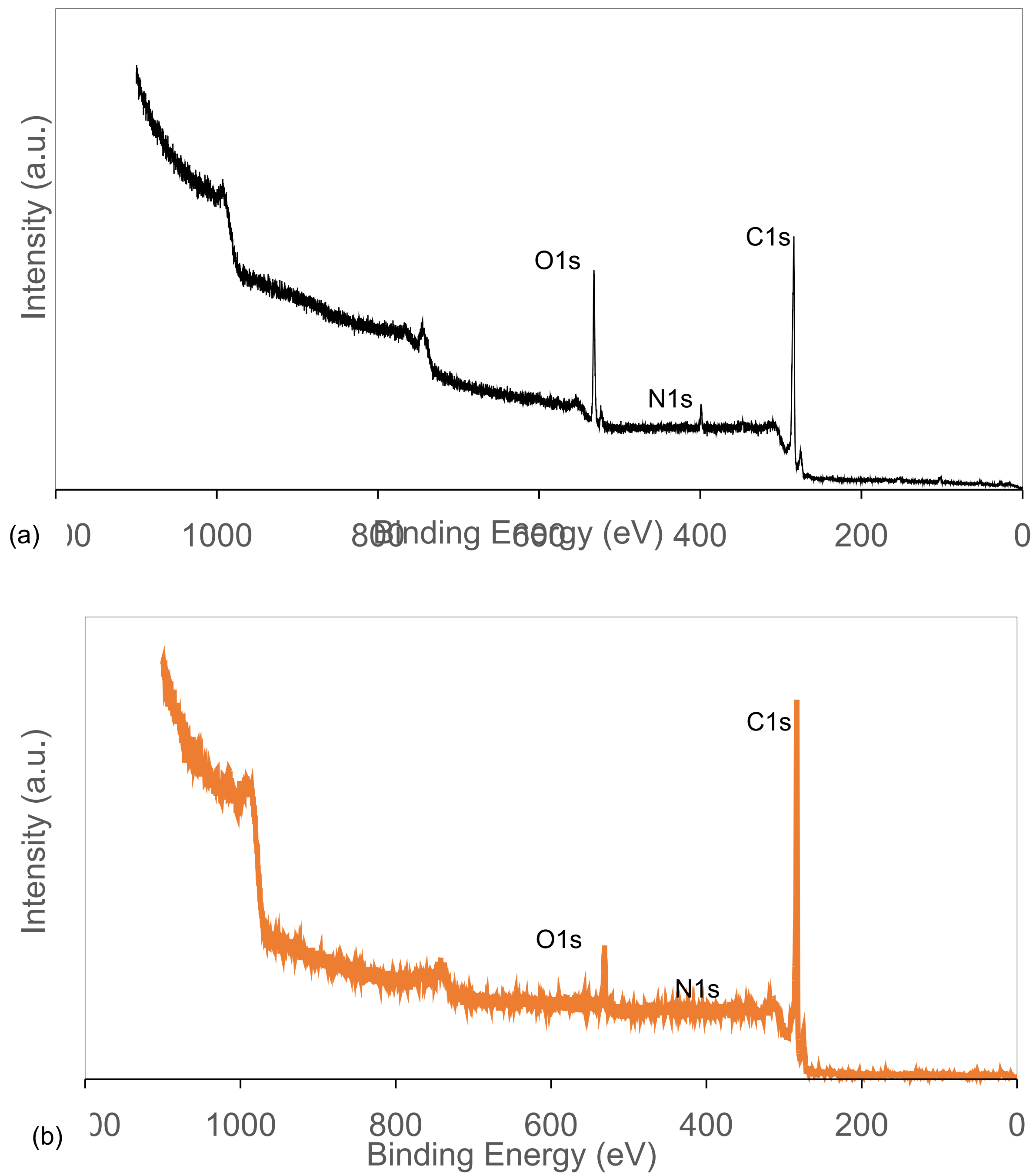

Figure S2: (a) – XPS Survey scan of plasma functionalized CNT sheets treated with epoxy solution in toluene in the absence of curing agent; (b) – XPS survey scan of plasma functionalized CNT sheet.

Table S1: Effect of plasma power (W) and %wt. CNT content on the mechanical properties of CNT/Epoxy composites and CNT sheets.

Plasma Power (W) ↓	**% wt. CNT Content** →	**100**	**82**	**63**	**42**	**24**
0W	Tensile Stress (MPa)	410.78	479.53	487.64	455.51	418.47
	Modulus (GPa)	23.76	29.18	36.14	40.31	37.38
80W	Tensile Stress (MPa)	344.83	548.71	560.68	562.67	457.11
	Modulus (GPa)	22.36	39.91	42.6	51.23	48.67
100W	Tensile Stress (MPa)	331.30	624.56	**698.17**	646.35	595.52
	Modulus (GPa)	22.56	44.78	**64.51**	70.36	54.27