

Supplementary Information

Low temperature bottom-up approach for the synthesis of few layered graphene nanosheets via C–C bond formation using a modified Ullmann reaction

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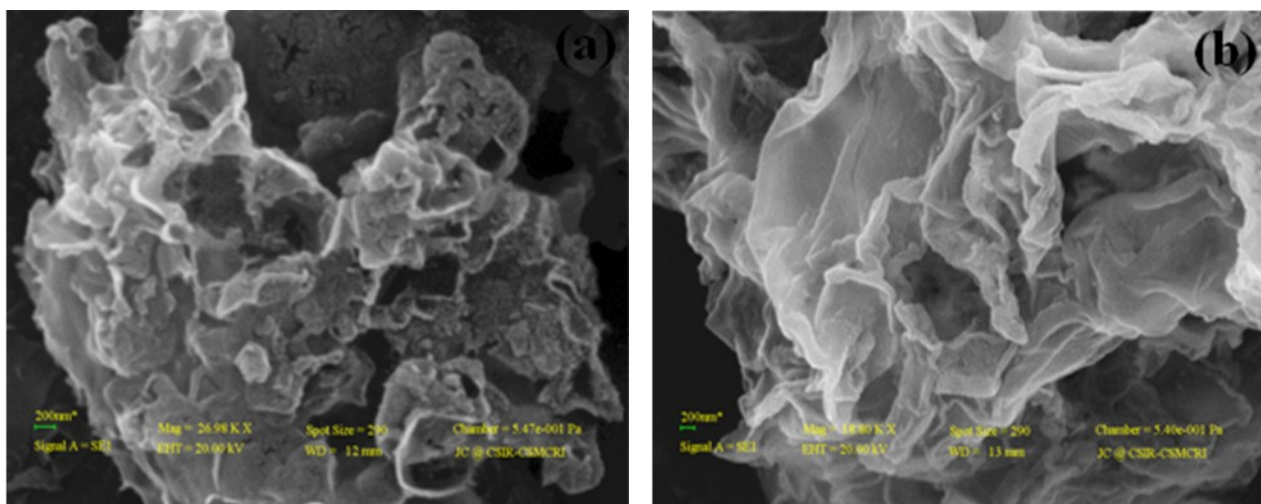


Fig. S1 SEM images (a) carbon product obtained from carbon tetrachloride as carbon source and (b) foam like structure containing graphene sheets obtained from dichloromethane as carbon source.

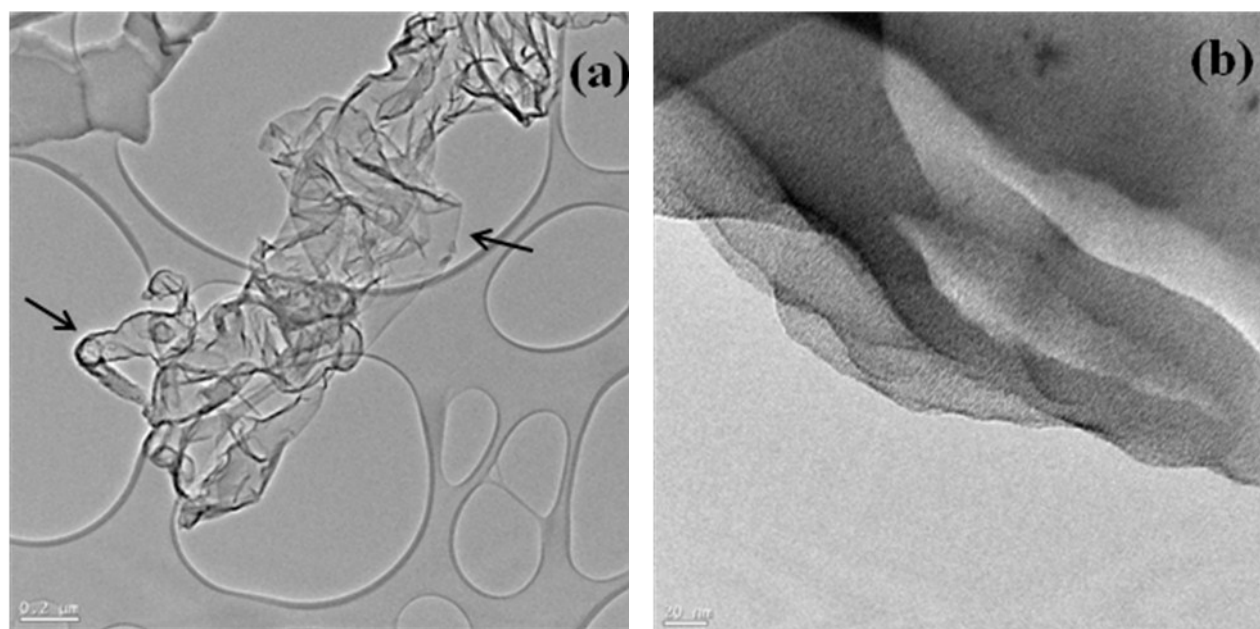


Fig. S2 TEM images showing (a) graphene sheets along with micro tube prepared using carbon tetrachloride as carbon source and (b) carbon foam containing graphene sheets obtained from dichloromethane as carbon source.

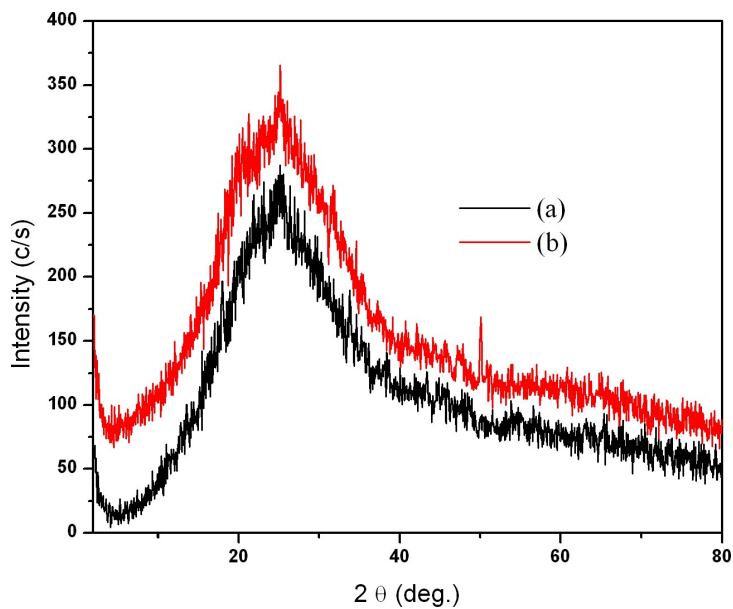


Fig. S3 XRD pattern of carbon products obtained using (a) carbon tetrachloride and (b) dichloromethane as carbon source.

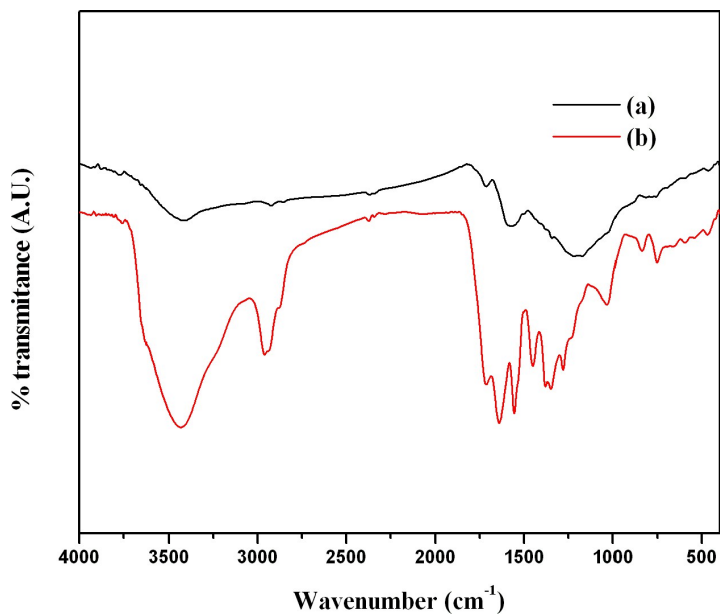


Fig. S4 FT-IR spectrum showing the distinguishable surface functionality of carbon products prepared using (a) carbon tetrachloride and (b) dichloromethane as carbon source.

The above FT-IR spectrums clearly indicates the difference in surface functionality of carbon products obtained from different carbon precursor i.e. carbon tetrachloride and dichloromethane. The FT-IR spectrum of product obtained from dichloromethane indicated the presence of C=C–H and CEC–H functionality. Whereas the C–H functional groups were found absent in the product obtained from the carbon tetrachloride due to the lack of hydrogen in the carbon precursor. The abundance of C–Cl groups were also high in case of carbon product produced from dichloromethane indicated by comparatively sharp C–Cl absorption band at ~ 750 cm⁻¹ which also evidenced by the elemental chlorine analysis.

Table S5 The elemental composition of carbon produced from (A) carbon tetrachloride and (B) dichloromethane as carbon precursor.

Elements	CHN/O/Cl analysis	
	(A)	(B)
Carbon	66.57	65.68
Hydrogen	0.79	3.65
Nitrogen	0.87	1.46
Oxygen*	26.58	14.48
Chlorine	5.19	14.73

* calculated by the difference