Supporting Information (SI-I)

Table 1 Raman Spectroscopy Reference Data

No.	Reference (data for single layer graphene with green laser (514, 538 nm) excitation for Raman spectroscopy)	Position of G peak (cm^{-1})	Position of 2D peak (cm^{-1})	FWHM of 2D peak (cm^{-1})
1.	Raman Spectrum of Graphene and Graphene Layers by Geim *et. al. Phys. Rev. lett.* **2006**, *97*, 187401	~1580	~2700	~25
2.	G' band Raman spectra of single, double and triple layer graphene by Dresselhaus *et. al. Carbon*, **2009**, *47*, 1303	-	~2700	18-28
3.	Spatially Resolved Raman Spectroscopy of Single- and Few-Layer Graphene D. Graf *et. al. Nano Lett.*, **2007**, *7*, 238	~1582	~2700	30
4.	Raman fingerprint of charged impurities in graphene A. C. Ferrari *et. al. Appl. Phys. Lett.*, 2007, 91, 233108	1560-1580	~2700	28-30
5.	Temperature Dependence of the Raman Spectra of Graphene and Graphene Multilayers by A. A. Balandin et. al. *Nano Lett.*, **2007**, *7*, 2645	~1582	2691 (488 nm laser)	-
6.	Freestanding Graphene by Thermal Splitting of Silicon Carbide Granules by X. Bao *et. al. Adv. Mater.* **2010**, *22*, 2168	~1585	~2700	-
7.	Raman spectroscopy of graphene and graphite: Disorder, electron–phonon coupling, doping and nonadiabatic effects by A. C. Ferrari *Solid State Commun.*, 2007, **143**, 47	~1580	~2700	~25
8.	Our work	1585	2696	51

Table 2 Raman Spectroscopy Reference Data for 1, 2, 3 layer graphene compared to our work

No of graphene layers	Position of 2D peak (cm^{-1})	FWHM of 2D peak (cm^{-1})
1	~2700±5	20-30
2	~2710	30-55
3	~2715	more than 60
Our work	2696	51

References:

1. C. Ferrari, J. C. Meyer, V. Scardaci, C. Casiraghi, M. Lazzeri, F. Mauri, S. Piscanec, D. Jiang, K. S. Novoselov, S. Roth, and A. K. Geim Phys. Rev. Lett. 2006, **97**, 187401 .
2. J.S. Park, A. Reina, R. Saito, J. Kong, G. Dresselhaus, M.S. Dresselhaus Carbon, 2009, **47**, 1303.
3. D. Graf , F. Molitor , K. Ensslin , C. Stampfer , A. Jungen , C. Hierold , and L. Wirtz Nano Lett., 2007, **7**, 238.
4. C. Casiraghi, S. Pisana, K. S. Novoselov, A. K. Geim, and A. C. Ferrari Appl. Phys. Lett., 2007, **91**, 233108.
5. I. Calizo , A. A. Balandin , W. Bao , F. Miao , and C. N. Lau Nano Lett., 2007, **7**, 2645.
6. Dehui Deng, Xiulian Pan*, Hui Zhang,Qiang Fu, Dali Tan, Xinhe Bao *Adv. Mater.* 2010, **22**, 2168.
7. A. C. Ferrari *Solid State Commun.*, 2007, **143**, 47.

Electronic Supplementary Material (ESI) for RSC Advances

Supporting Information (SI-II)

The possible mechanism for formation of graphene is described below. Upon pyrolysis of the polymer, first a carbon sheet with sodium carbonate is formed. This can be considered as a bottom-up process wherein the 1D polymer chain is converted to 2D carbon sheet (figure 1).

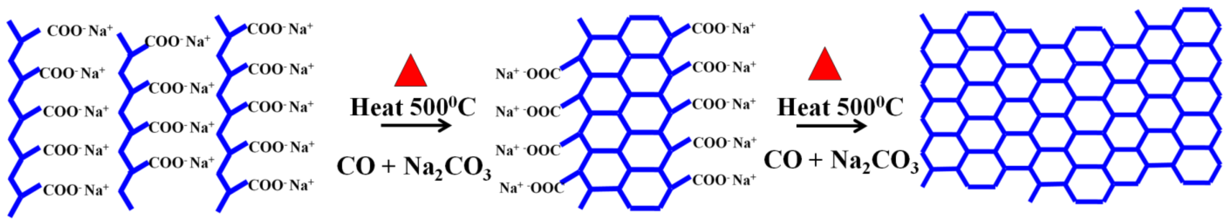

Figure 1. Possible mechanism for formation of graphene sheet by pyrolysis of the specific polymer

When the poly(acrylic acid) sodium salt is heated, adjacent polymer chains undergo a condensation reaction with loss of sodium carbonate and CO leading to the formation of 2D stable six-member ring structure. Due to the high temperature treatment, the carbon six member ring structures undergo aromatization which leads to the formation of an extended graphitic network. The overall structure thus formed is a graphene sheet possibly with some defects. The by-products of pyrolysis process are CO and Na_2CO_3. The sodium carbonate formed during pyrolysis hinders the stacking of graphene sheets as it intercalates between different sheets. Once the pyrolised product is washed with D.I. water, the sodium carbonate is dissolved and completely removed, leaving dispersed ultrathin (1 or 2 layered) graphene sheets.