Electronic Supplementary Material (ESI) for RSC Advances.

Supplementary Information

Mechanical and thermal behaviours of graphite flake reinforced acrylonitrile butadiene styrene composites and their correlation with entanglement density, adhesion, reinforcement and C factor

Alok Kumar Pandey[1], Ravindra Kumar[1], Vashu Singh Kachhavah[1] and Kamal K. Kar[1, 2*]
[1]Advanced Nanoengineering Materials Laboratory, Materials Science Programme, Indian Institute of Technology Kanpur, Kanpur-208016, India.
[2]Advanced Nanoengineering Materials Laboratory, Department of Mechanical Engineering, Indian Institute of Technology Kanpur, Kanpur-208016, India.
*Corresponding Author (Email:kamalkk@iitk.ac.in, Fax: +91-5122597408, Phone:+91-5122597687)

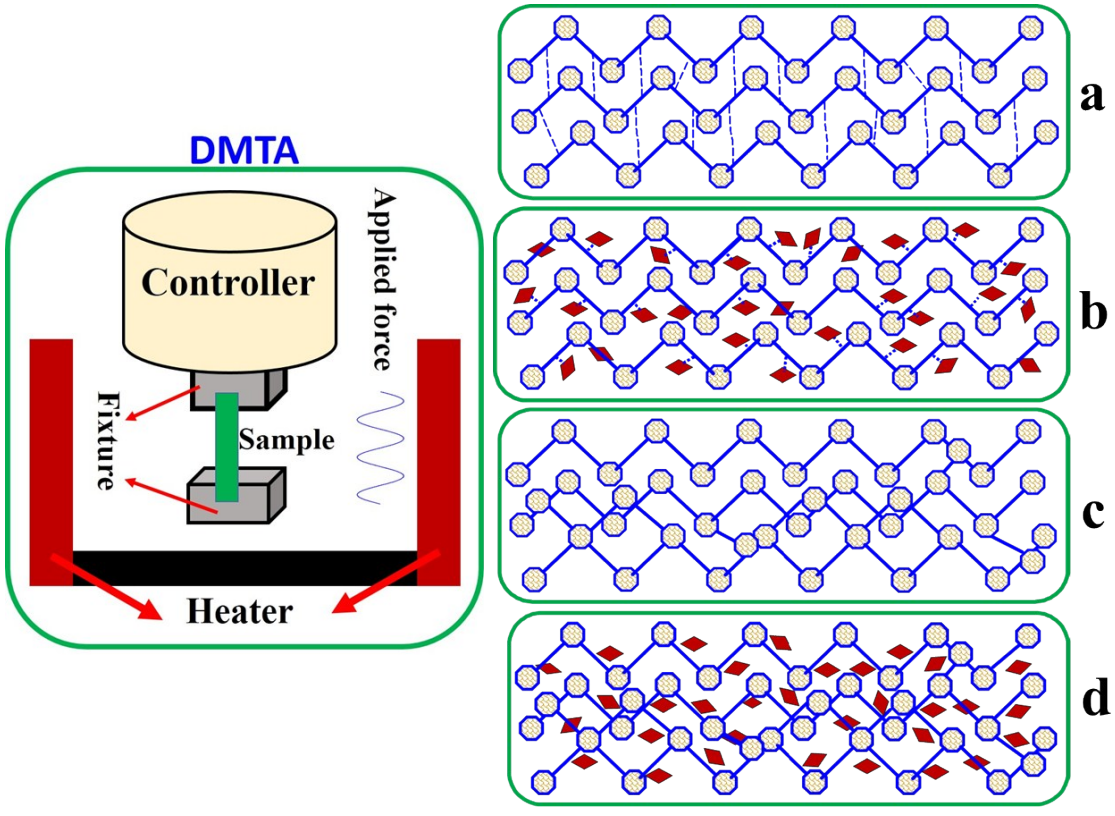

Fig. S1. Schematic of DMTA; (a) ABS polymer in absence of heat (dotted lines represents weak interaction among chains), (b) ABS polymer reinforced with GF, restriction in the movement of polymeric chains in absence of heat (dotted lines represents weak interaction among polymeric

chains and GF) (c) random movement of ABS polymeric segments on application of heat, and (d) the reinforced GF applied restriction in the movement of chains during applied heat.

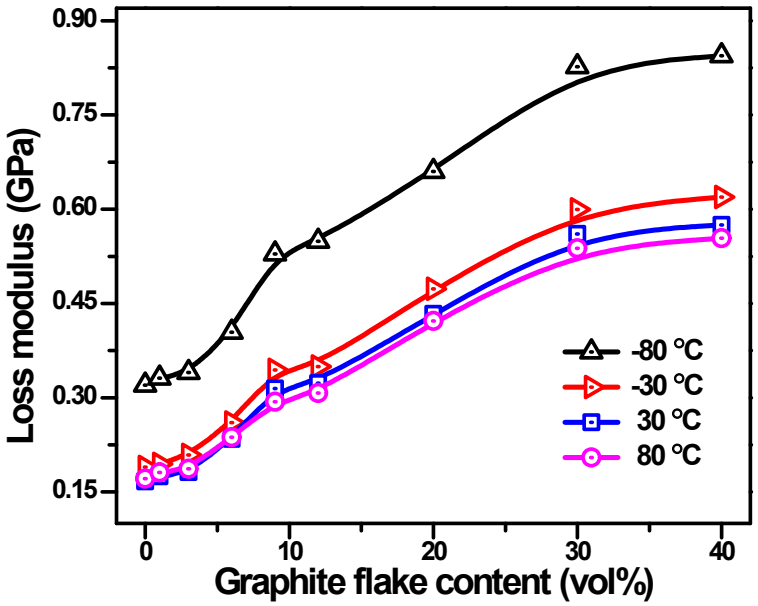

Fig. S2. Variation in loss modulus for 0 to 40 vol% of GF reinforced ABS/GF composites at four different temperatures.

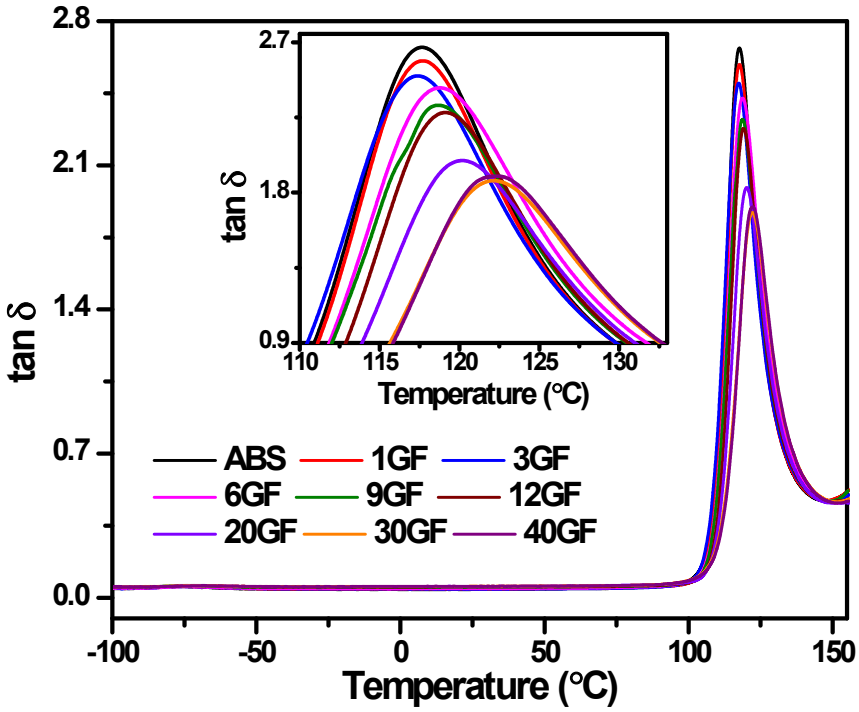

Fig. S3. Damping factor vs. temperature for 0 to 40 vol% of GF reinforced ABS/GF composites (inset shows the enlarged view of tan δ peaks).

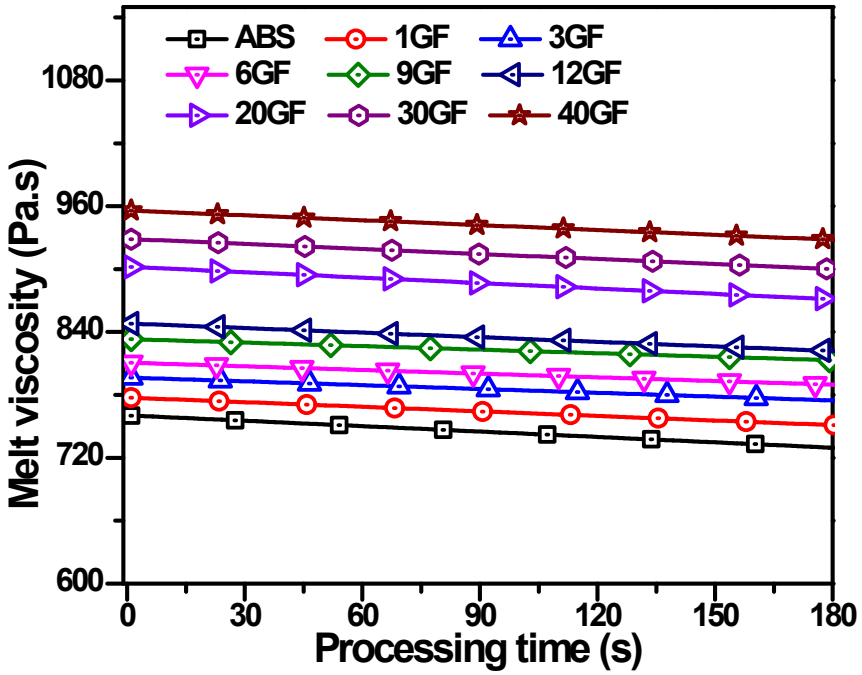

Fig. S4. Variation in melt viscosity with processing time for different ABS/GF compositions.

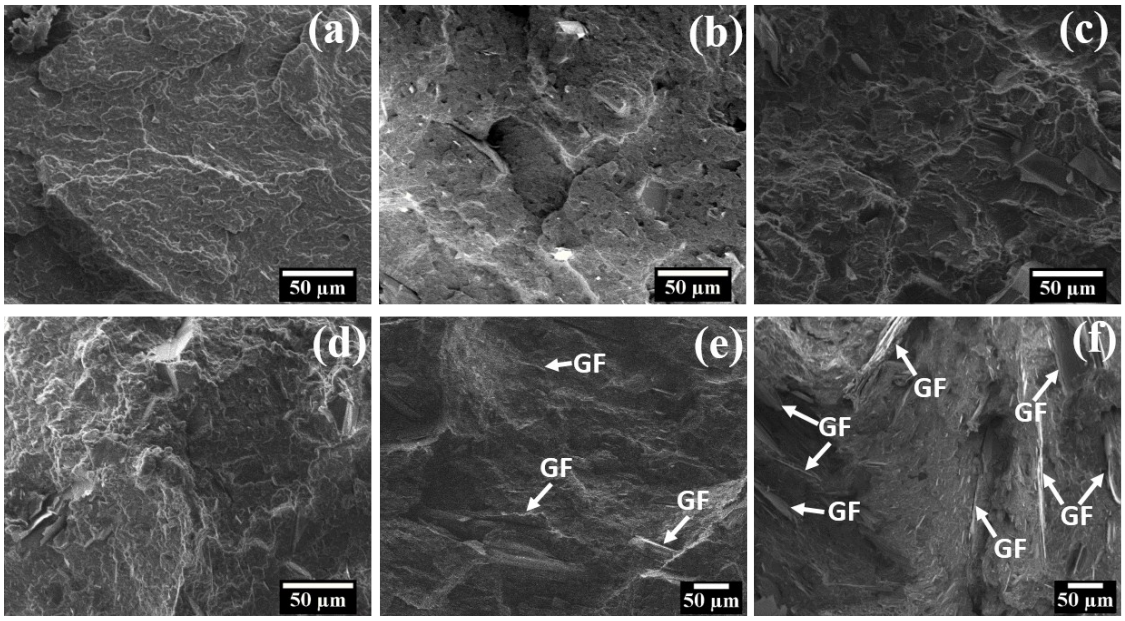

Fig. S5. Fractured surfaces of the composites having (a) 1, (b) 3, (c) 6, (d) 9, (e) 12 and, (f) 30 vol% GF reinforced ABS composites.

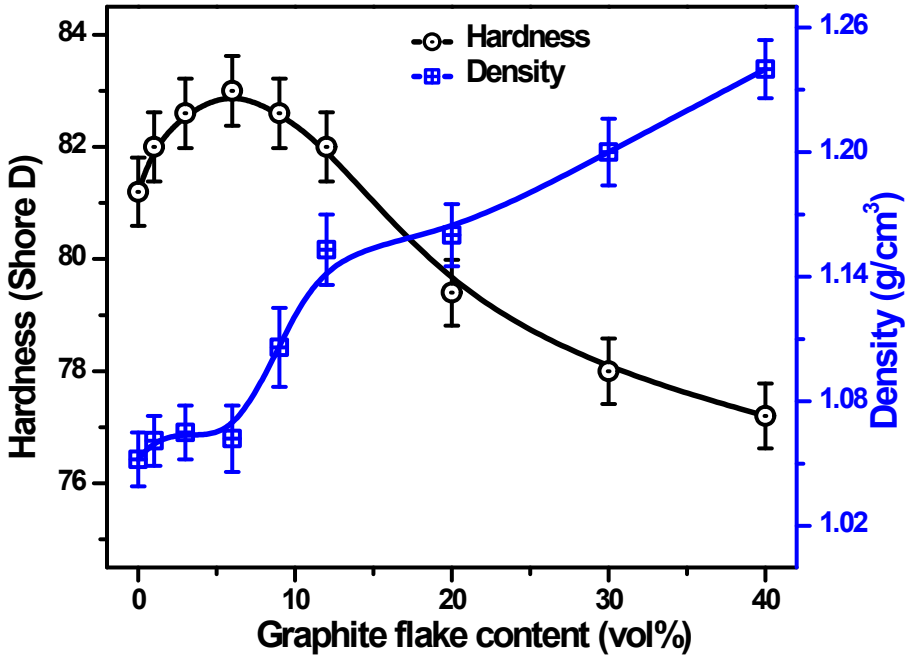

Fig. S6. Shore-D hardness and bulk density of ABS/GF composites having 0 to 40 vol% GF.