Electronic Supplementary Material (ESI) for RSC Advances.

Electromagnetic shielding and mechanical properties of thermally stable poly(ether ketone)/multi-walled carbon nanotubes composites prepared using twin-screw extruder equipped with novel fractional mixing elements

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Supplementary information:

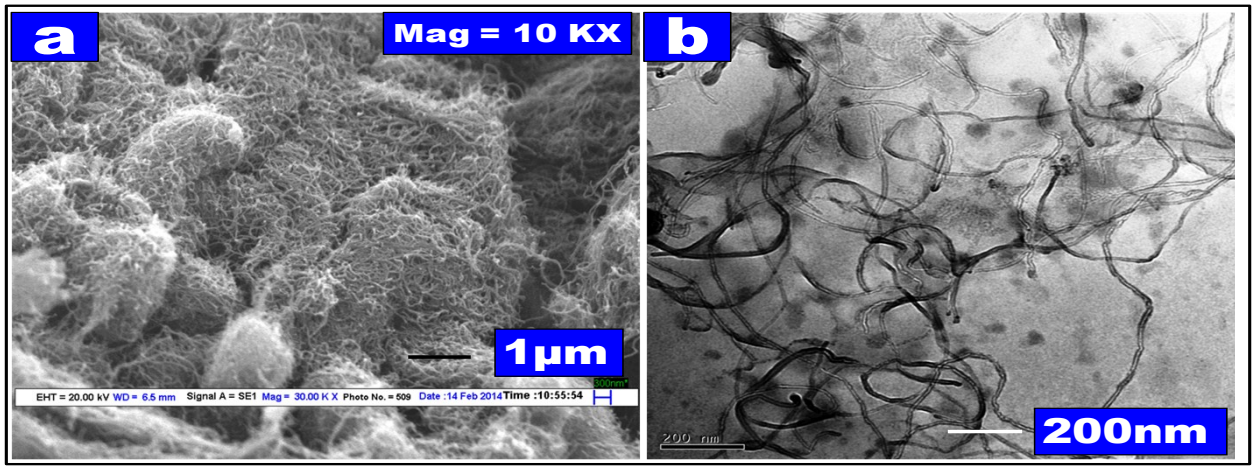

Fig: S1. (a) SEM and (b)TEM images of MWCNT

Table S1: Configuration/Specifications of the Alpha 18 co-rotating twin screw extruder equipped with fractional mixing elements

Specifications/Configurations	Value	Specifications/Configurations	Value
Barrel diameter (mm)	18.8	Maximum drive power (kW)	7.5
Screw Outside Diameter (mm)	18.5	Maximum screw speed (rpm)	1200
Screw Inside Diameter (mm)	12.7	Specified Nominal torque (Nm)	60
Diameter ratio (Do/Di)	1.48	Throughput (kg./h)	5-10
Flight depth (mm)	3.05	Length (m)	2.3
Barrel to screw clearance (mm)	0.15	Height (m)	1.4
Screw to Screw clearance (mm)	0.40	Width (m)	0.8
Shaft diameter (mm)	10	Weight (kg)	1050
Shaft torque capacity (%)	250		

Table S2: Data scatter information of electrical conductivity (S/cm), tensile modulus (MPa) and tensile strength (MPa)

Sample designation	Conductivity (S/cm)	Tensile modulus (MPa)	Tensile strength (MPa)
PEK	4.02E-13±3E-13	4370±69	80.4±1.75
PEK-0.15	4.42E-10±2.4E-10	4536±87.2	87.9±1.35
PEK-0.3	1.08E-08±6E-9	4577±78.5	91.9±1.57
PEK-0.6	1.13E-7±1.2E-8	4761±138.5	101.5±1.30
PEK-1.2	1.15E-6±1.3E-7	4764±85.5	102.9±1.55
PEK-1.9	7.36E-6±2.3E-6	4913±90.5	103.8±1.83
PEK-3.2	2.89E-5±1.1E-5	5208±98.4	116±1.7
PEK-6.4	2.11 E-3±1.09E-3	6084±136.3	119±2

Table S3: Results of TGA traces for PEK and PEK/MWCNT composites:

Sample designation	$T_{0.1}$ (°C)	$T_{0.2}$ (°C)	$T_{0.3}$ (°C)	T_{max} (°C)	Char yield (%)
PEK	568.6	582.6	600.6	579.6	51.8
PEK-0.15	568.5	582.5	604.5	579.8	56.2
PEK-0.3	568.6	582.6	601.6	584.1	56.4
PEK-0.6	569.6	584.6	604.6	582.8	55.9
PEK-1.2	571.6	584.0	604.6	583.9	57.7
PEK-1.9	571.0	585.0	607.0	581.1	58.4
PEK-3.2	580.7	594.7	617.8	591.4	59.8
PEK-6.4	581.8	597.8	622.8	594.4	59.5