

## List of Tables

**Table.1** Sample configuration of PVDF/PSF/GO nano blend.

Polymer Blends				
PVDF (wt%)	PSF (wt%)	GO (untreated) (wt%)	GO (15 min treated) (wt%)	GO (30 min treated) (wt%)
95	5	-	-	-
90	10	-	-	-
85	15	-	-	-
95	4.5	0.5	0.5	0.5
90	9	1	1	1
85	13.5	1.5	1.5	1.5

**Table2.** FTIR peak assignments of virgin and modified PVDF/PSF/GO nano blends.

Sample	Treated/untreated GO	Peak position (cm <sup>-1</sup> ) and functional groups
Pure PVDF/PSF	--	2970-O-H stretch, 1675-C=O stretch, 1582,1486-C=C bonding, 1400-1000-CF stretch, 1291-O=S=O-asymmetric stretch, 1144-O=S=O symmetric stretch and 876,835-CF <sub>2</sub> bonding.
PVDF/PSF/GO	Untreated	2970-O-H stretch, 1675-C=O stretch, 1582,1486-C=C bonding, 1400,1325, 1011-CF stretch, 1291-O=S=O asymmetric stretch, 1230-C-OH stretch, 1161,1103-C-O stretch, 1144- O=S=O symmetric stretch and 876, 835-CF <sub>2</sub> bonding
PVDF/PSF/GO	15 min treated	2970-O-H stretch, 1675-C=O stretch, 1582,1486-C=C bonding, 1400,1325, 1011-CF stretch, 1291-O=S=O asymmetric stretch, 1230-C-OH stretch, 1103-C-O stretch, 1144- O=S=O symmetric

		stretch and 876, 835-CF <sub>2</sub> bonding
PVDF/PSF/GO	30 min treated	2970-O-H stretch, 1675-C=O stretch, 1582,1486-C=C bonding, 1400,1325, 1011-CF stretch, 1291-O=S=O asymmetric stretch, 1230-C-OH stretch, 1161,1103-C-O stretch, 1144- O=S=O symmetric stretch and 876, 835-CF <sub>2</sub> bonding

**Table 3** Evaluation of I<sub>D</sub>/I<sub>G</sub> ratio and cluster size of pre and post treated GO.

Sample	Peak intensity of D band (a.u.)	Peak intensity of G band (a.u.)	I <sub>D</sub> /I <sub>G</sub> ratio	Cluster size	Significance
Untreated GO	7650 (1341 cm <sup>-1</sup> )	15435 (1568 cm <sup>-1</sup> )	0.50	8.81	Imperfections in Structure
30 min treated GO	7612 (1329 cm <sup>-1</sup> )	23482 (1551 cm <sup>-1</sup> )	0.32	13.88	Imperfections decreased
15 min treated GO	3327 (1324 cm <sup>-1</sup> )	13501 (1551 cm <sup>-1</sup> )	0.25	17.62	Imperfections decreased

**Table4.** Calculated parameters of virgin and modified PVDF/PSF/GO nanoblends.

Polymer Blend	Filler	Crystallite size D (nm)	Interplanar spacing d (Å)	Degree of crystallinity (%)
PVDF/PSF (95/05)	-	9.52	4.69	27.72
PVDF/PSF (90/10)	-	9.70	4.69	26.36
PVDF/PSF (85/15)	-	9.62	4.52	20.83
PVDF/PSF (95/4.5)	Untreated GO (0.5wt%)	8.92	3.51	40.10
PVDF/PSF (90/09)	Untreated GO (1wt%)	7.69	3.34	42.28
PVDF/PSF (85/13.5)	Untreated GO (1.5wt%)	5.65	3.23	43.12
PVDF/PSF (95/4.5)	15 min plasma treated GO (0.5wt%)	6.61	3.14	28.25
PVDF/PSF (90/09)	15 min plasma treated GO (1 wt%)	5.39	3.11	31.35
PVDF/PSF (85/13.5)	15 min plasma treated GO (1.5wt%)	4.82	3.11	35.27
PVDF/PSF (95/4.5)	30 min plasma treated GO (0.5wt%)	5.80	3.02	23.96
PVDF/PSF (90/09)	30 min plasma treated GO (1wt%)	5.47	2.98	30.40
PVDF/PSF (85/13.5)	30 min plasma treated GO (1.5wt%)	5.14	2.97	33.77

**Table5.** Dielectric properties of virgin and modified PVDF/PSF/GO nano blends

Polymer Blend	Filler	$\epsilon_r$	$\tan\delta$	Frequency (Hz)
PVDF/PSF (95/05)	-	82	2.52	10
PVDF/PSF (90/10)	-	58	3.16	10
PVDF/PSF (85/15)	-	89	2.10	10
PVDF/PSF (95/4.5)	Untreated GO (0.5wt%)	213	3.13	10
PVDF/PSF (90/09)	Untreated GO (1wt%)	273	4.17	10
PVDF/PSF (85/13.5)	Untreated GO (1.5wt%)	180	1.61	10
PVDF/PSF (95/4.5)	15 min plasma treated GO (0.5wt%)	222	3	10
PVDF/PSF (90/09)	15 min plasma treated GO (1 wt%)	250	2.47	10
PVDF/PSF (85/13.5)	15 min plasma treated GO (1.5wt%)	208	2.63	10
PVDF/PSF (95/4.5)	30 min plasma treated GO (0.5wt%)	296	2.21	10
PVDF/PSF	30 min plasma	360	2.83	10

(90/09)	treated GO (1wt%)			
PVDF/PSF (85/13.5)	30 min plasma treated GO (1.5wt%)	260	1.97	10