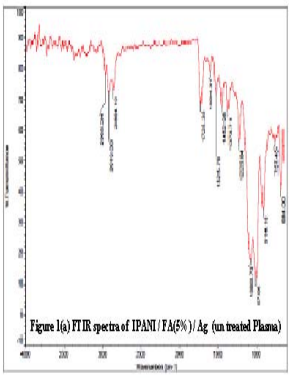
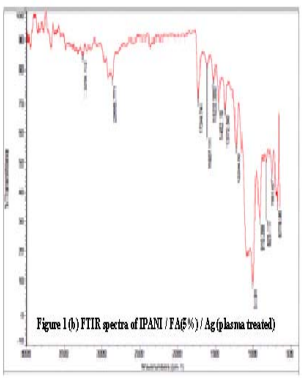
3. Results and Discussion

3.1 FTIR Spectra

The FTIR spectra recorded for IPANI / FA (5%) / Ag nano composites (untreated and treated Plasma) as shown in figure1(a)and (b).The characteristics peaks of pure PANI observed around 2965.342919.00,1725.35, 1525.78,1452.98,1225.84,1080.73,914.18and684.00. The band assignments of the FTIR spectrum of polyaniline are given in Table.1.

IR Frequency (Cm^{-1})		*Bond and Functional Groups*
Untreated	*Treated plasma*	*Untreated plasma and Treated plasma*
2866.71	2864.10	C-H Stretch
3258.12	2965.34	N-H Stretching in Primary amine
1724.74	1725.35	-C=C- Stretch
1522.32	1525.78	N-H bending
1452.19	1452.98	C-C Stretch in Aromatic
1224.50	1225.84	C-N Stretch
1003.91	1080.73	=C-H bending
910.39	914.18	N-H Wag
678.96	684.00	C-H bending





3.2 XRD

The X-ray diffraction data for I PANI+ 5% FA + Ag nanoparticle (Un treated and treated plasma) as shown in figure2(a) and (b). The X-ray scattering pattern exhibits amorphous nature. The shifting in position is due to different crystalline behaviour and structure of PANI. However results reveals the strong crystalline nature of synthesissed of PANI. There are major changes in the shape and position of the diffraction peaks after plasma treatment (Table-2)

Table 2: XRD Spectra of Polyaniline and treated polyaniline

Untreated Plasma		Treated Plasma	
2θ	d- Spacing	2θ	d- Spacing
19.577°	4.5308°	19.256	4.6055
26.925°	3.0876°	35.320	2.5263
36.535°	2.5243°	37.891	2.3725
38.396°	2.3425°	44.007	2.0669

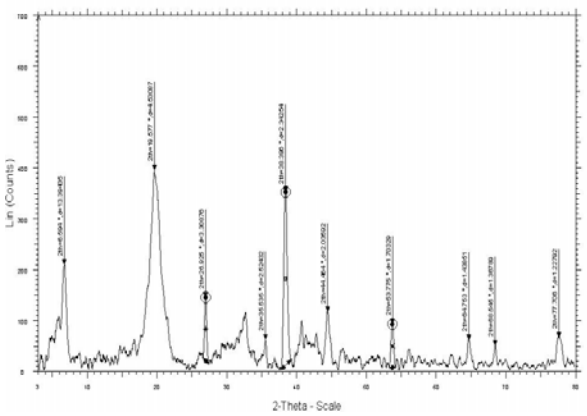


Figure 2: (a) XRD spectra of IPANI+5%FA+Ag (untreated plasma)

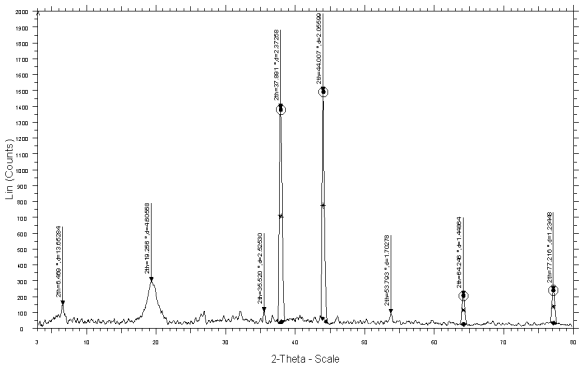


Figure 2: (b) XRD spectra of IPANI+5%FA+Ag (treated plasma)

3.3 SEM

SEM of untreated and treated plasma IPANI/5%FA+Ag nano particle is shown in figure 3(a) and (b). From the figure 3(a) It shows the presence of silver nano rod shaped structure, which are homogenously distributed throughout the composited. The particles size throughout the composites. The particles size of raw FA varies between 191.66 nm and 2.31µm. This is because of the presence of FA/Agno surfaces is likely to give the strong interfacial interaction between the polymer matrix and the Agno in polymer composites. From the figure 3(b) It shows the presence of very high magnification reveals the homogenous distribution of fly ash particles. Hence, a network of flyash and granular polyanilne has been formed in case of composites. The particle size of FA varies between 285.71 nm and 342.86µm. The amount of porosity induced in these composites sample increases at W% of FA in IPANI+5% FA +Agno free standing thin film. By comparing treated and un treated plasma of IPANI+5%FA +Agno, it can be conclude that the gradual increases in granular size and change in morphological helps the transportation of charge particles through the carbon back-bone of polymer chains [16]

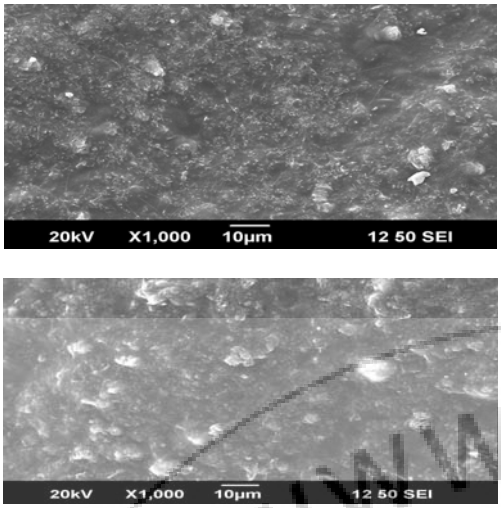


Figure 3: (a) SEM photographs of IPANI+5%FA+Ag (untreated plasma)

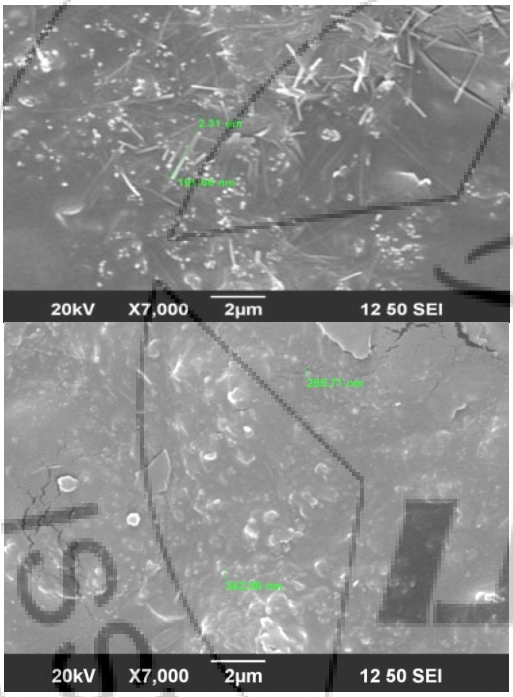


Figure 3 (b): SEM photographs of IPANI+5%FA+Ag (treated plasma)

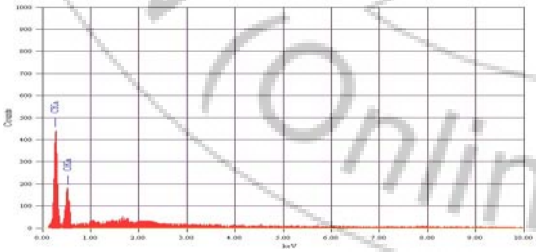


Figure 3(a): EDAX photographs of IPANI+5%FA+Ag (untreated plasma)

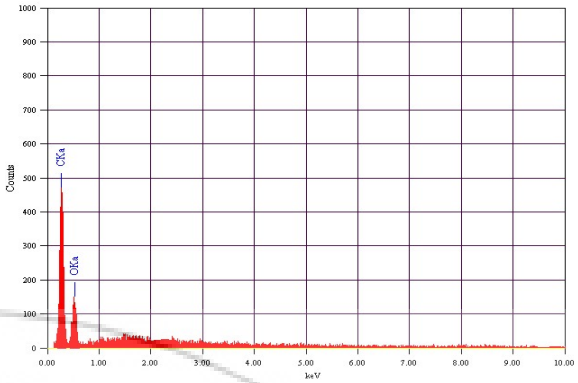


Figure 3(b): EDAX photographs of IPANI+5%FA+Ag (treated plasma)

4. Conclusion

Low pressure DC Low temperature plasma treatment has been used to modify the IPANI / FA (5%) / Ag film surfaces. It was found that the plasma treatment modified the surface both in chemical composition and morphology. FTIR spectra showed the increases in absorption bands due to plasma treatment. XRD spectra of highly ordered structures of composites were confirmed. SEM study reveals that granular shape structure morphology of PNI-Ag nanocomposite

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