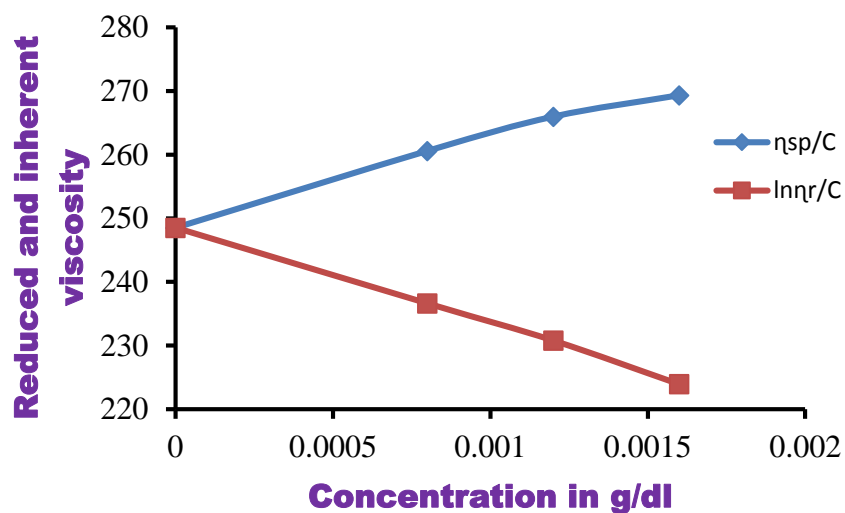


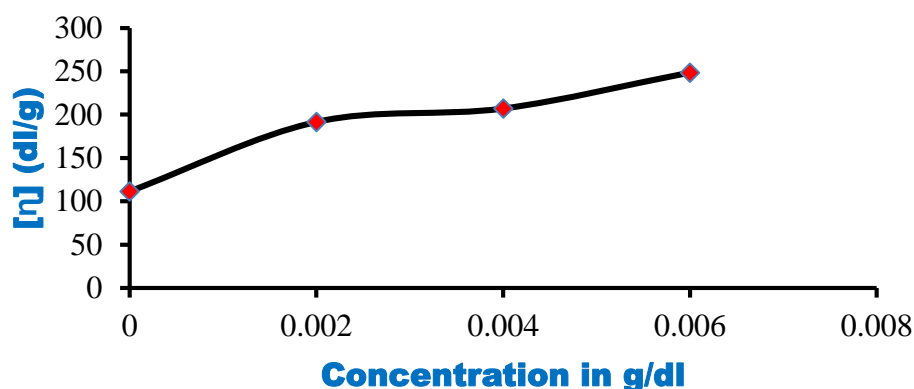
**Figure 9:** Plot of reduced and inherent viscosity for different concentration of PEO with 0.008 g/dl of Sr/CuO nanoparticles.

**Table 5:** Viscosity data for different concentrations of PEO with 0.012g/dl of Sr/CuO.

Concentration of PEO (g/dl)	Flow time, t (sec)	Relative viscosity $t/t_0=\eta_r$	Specific viscosity $\eta_r-1=\eta_{sp}$	Reduced viscosity $\eta_{sp}/C$ (dl/g)	$\ln \eta_r$	Inherent viscosity $\ln \eta_r/C$ (dl/g)	Intrinsic viscosity $[\eta]$ (dl/g)
0.0008	157.09	1.2084	0.2084	260.57	0.1892	236.62	248.5
0.0012	171.49	1.3191	0.3191	265.96	0.2769	230.79	
0.0016	186.01	1.4309	0.4309	269.32	0.3583	223.93	



**Figure 10:** Plot of reduced and inherent viscosity for different concentration of PEO with 0.012g/dl of Sr/CuO nanoparticles.



**Figure 11:** Plot of intrinsic viscosity  $[\eta]$  for different concentrations of Sr/CuO nanoparticles.

The study of variation of the intrinsic viscosity  $[\eta]$  against the concentration of Sr/CuO nanoparticles reveal that there is a gradual increase in the intrinsic viscosity of the polymer solution as the concentration of the Sr/CuO nanoparticles is increased. During the polymer dissolution, a slow penetration of the nanoparticles into the interstices of the polymer exists and forces them to swell which is also evident by the increase in intrinsic viscosity in polymer upon increase in % wt of doping. The process of swelling increases the volume of the PEO polymer matrix. The giant size and the increased volume of the polymer molecules as the concentration of Sr/CuO nanoparticles increases restrict its molecular mobility in the solution and increase inter molecular friction. The PEO:Sr/CuO polymer nanocomposite solution is therefore highly viscous.

## CONCLUSION

PEO:Sr/CuO polymer nanocomposite films were prepared from PEO aqueous solution and Sr/CuO nanoparticles by solution casting method. The SEM images of PEO:Sr/CuO showed that the polymer nanocomposite film surfaces had characteristic structures pertaining to different concentration of Sr/CuO dopant nanoparticles. Incorporation of Sr/CuO nanoparticles into PEO matrix induces the corresponding shift in the absorption bands which were observed by XRD and IR techniques. UV-Vis spectroscopy reveals the blue shift in the absorption edge indicating an increase in the bandgap energy upon doping. The conductivity and potential measurement studies indicates an increase in conductance and potential with increase in the amount of Sr/CuO dopant nanoparticles. The viscosity studies revealed that there is a gradual increase in the intrinsic viscosity of the polymer solution as the concentration of the Sr/CuO nanoparticles is increased.

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