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## Influence of biopolymer and the polyol newtonian fluid on properties of extrusion inks of carbon nanotubes

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Extrusion printing inks were prepared with multiwall carbon nanotube (MWNT) and iota-carrageenan (IC), a biopolymer thickening agent containing two sulphated groups, extracted from red seaweeds and with glycerine, a polyol newtonian fluid. After adjusting for the proper viscosity of both the inks i.e. IC-MWNT and G-MWNT, they were extruded by a syringe printer on glass slide, IC gel films and PET transparent sheet. Conductive tracks of the deposited printed inks were characterized with microscope, SEM, profilometer, contact angle measurement

and conductivity determination. Conductivity of IC-MWNT track was  $9 \pm 1$  S/m and that of G-MWNT was  $2942 \pm 84$  S/m on glass substrate of one layer thick. This is because a smaller number of CNT is present in G-MWNT track as confirmed by SEM study. Profilometry showed that increased number of extruded layers gave increased cross-sectional area. SEM study showed that printing ink is embedded into surface of IC film, discontinuous on glass slide and smoother on PET sheet.

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