

## Electrically conductive microcellular foams incorporated with modified carbon nanofillers

안지훈, 유영욱, 이성재†

수원대학교

(sjlee@suwon.ac.kr†)

High internal phase emulsion (HIPE) is an emulsion in which the dispersed phase occupies greater than the maximum packing volume fraction. The microstructured foam prepared from HIPE has smaller cell size than that of conventional extruded foam and shows open cell type. Recently, researches are being conducted to introduce carbon nanofillers such as CNT and graphene for application to conductive fields. In the case of graphene, graphene oxide (GO) and reduced graphene oxide (RGO) are mostly used as conductive fillers. In this study, styrene based water-in-oil HIPEs were prepared by introducing polydopamine (PDA)-coated CNT or RGO to aqueous phase and then polymerized to produce electrically conductive polyHIPE foams. The carbon nanofiller coated with PDA, a hydrophilic polymer, improved the dispersion stability of HIPE. In addition, the introduction of sulfonic group into polyHIPE resulted in the formation of a conductive path and a significant increase in electrical conductivity. The yield stress and storage modulus of HIPE were analyzed with the content of modified nanofiller. The morphology and electrical conductivity of polyHIPE foams were investigated.