عنوان مقاله:

Microcellular foaming of polypropylene/graphene oxide using supercritical carbon dioxide

محل انتشار:

چهارمین همایش بین المللی نفت، گاز، پتروشیمی و HSE (سال: 1398)

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خلاصه مقاله:

In this work, nanocomposites containing polypropylene (PP) and surface functionalized graphene oxide (FGO) were prepared using a simple method based on in-situ generation of supercritical carbon dioxide (sc-CO2) from dry ice. This method compared to conventional methods exempted from high pressure pump and separated CO2 tank. State of FGO dispersion in the matrix was characterized using X-Ray Diffraction (XRD) and Field Emission Scanning Electron Microscopy (FESEM). Effects of GO concentration as well as saturation temperature and saturation pressure on cellular morphology of the prepared foams were investigated by FE-SEM and the average of cell density and cell diameter of the prepared foams were studied by ImageJ image analysis software. It was observed that at constant foaming pressure of 170 bar, elevation of foaming temperature from 144 to 151°C increases cell size and decreases cell density of the prepared pure PP foam. Furthermore, an increase in foaming pressure from 130 bar to 170 bar resulted in reduction of cell size and an increase in cell density of the pure PP foam. Also, incorporation of FGO was shown to decrease average cell diameter of the PP foam from 159 (in the case of pure PP) to 68.48μm (in the case of PP- FGO foam containing 1 wt. % of FGO).

کلمات کلیدی:

graphene oxide, microcellular foam, polypropylene, supercritical carbon dioxide.