

3D Printable and Highly Conductive Polyurethane Composites Filled with Polyaniline and Graphene

박서린¹, 조성훈^{1,2,†}

¹영남대학교; ²화학공학부

(shcho83@yu.ac.kr[†])

Polyurethane (PU) is among the promising candidates for 3D printing because of its wide range of applications. This work reports comparative studies on the fabrication and optimization of PU composites using a polyaniline (PANI) nanomaterial and a graphene sheet (GS) for Digital light processing (DLP)-type 3D printing. As-prepared PU/PANI and PU/GS composites with different filler contents were successfully printed into sculptures with different sizes and shapes. The PU/PANI and PU/GS composites exhibit the improved sheet resistance, which is up to 8.57×10^4 times lower and 1.27×10^5 times lower, respectively, than the pristine PU. Moreover, the PU/PANI and PU/GS composites demonstrate 1.41 times higher and 2.19 times higher tensile strengths compared with the pristine PU. This work suggests the potential uses of highly conductive PU composites for DLP-type 3D printing.