Magnetic Nanoparticles Embedded LLDPE Nanofibrous Matrices for Effective Removal of Oils

이재욱, 남창우[1], 이효민[†]

포항공과대학교; [1]전북대학교

(hyomin@postech.ac.kr[†])

Recently, many materials have been explored for effectively removal of oils. Among them, linear low density polyethylene (LLDPE)-based interpenetrated polymer network absorbent has shown great potential for crude oil entrapment due to its highly absorption capacity as well as reusability. However, the film casting process typically used for preparation often results in absorbents with limited surface area for effective absorption of oils with high viscosity. In this work, we utilize electrospinning technique to prepare LLDPE nanofibrous matrices with dramatically enhanced specific surface area. We show that the electrospun LLDPE fibrous matrix has high absorption capacity, particularly for oils with high viscosity. In addition, the resulting nanofibrous matrix exhibits fast absorption kinetics by reaching its maximum absorption capacity within 15 minutes. Furthermore, magnetic nanoparticles (MNPs) are additionally embedded in the individual fibers to facilitate the recovery after use.