

Photothermal effect in patterned conjugated polymers

박치현, 김병관, 나중범, 박태훈, 임한휘, 서석재, 김은경*
연세대학교 화공생명공학과 유기정보소재연구실
(eunkim@yonsei.ac.kr*)

Conjugated heterocyclic polymers (CHPs) have been widely studied due to their electrically controllable optical and electrical properties. In organic electronics, these materials are universally adopted because of their long-term stability and low working voltages. In particular, their photothermal properties allow them to be practically applied into theragnosis based on chromogenic imaging and near-infrared (NIR) photothermal ablation. When patterned, these CHP films showed dramatically increased electro-optical and light harvesting properties. The effect of patterning onto photothermal properties of CHP films was also significant. Thus poly(3,4-ethylenedioxy-thiophene) (PEDOT) films were patterned by using pre-patterned polymer templates to prepare PEDOT film patterns in microscale and nanoscale. The temperature rise by irradiation of a NIR laser was determined as a photothermal effect. The temperature rise from the patterned PEDOT film was almost 30% higher than that of the PEDOT film. Effect of pattern structure on the photothermal properties of PEDOT films will be discussed.