

계면활성제 기반 산화그래핀층이 도입된 전기변색 poly (3-hexyl thiophene) 박막의 장기 수명 특성
Long term life-time of electrochromic poly (3-hexyl thiophene) films modified by surfactant-assisted
graphene oxide layers.

김태호^{a*}, 최기인^b, 김혜리^b, 오성현^c, 구자승^b, 나윤채^{a,c}

^a한국기술교육대학교 창의융합공학협동전공, ^b한국원자력연구원 중성자과학 연구부, ^c한국기술교육대학교 에너지신소재
화학공학부 (E-mail: ycnah@koreatech.ac.kr)

초 록 : In general, organic electrochromic (EC) materials have been known to be electrochemically unstable during the ionic exchange process. One effective method to realize stable EC materials is incorporating graphene derivatives in the polymer matrix, by using the strong interaction between graphene derivatives and polymer. However, previous studies are limited graphene derivatives. In this study, we developed a polymer-graphene derivative complex with the chemical assistance of a surfactant (octadecylamine, ODA). Surfactant-assisted graphene oxide (GO-ODA) was introduced as a protective layer on the electrochromic poly (3-hexyl thiophene) (P3HT) films by the Langmuir-Schaefer method. The deposition of GO-ODA protective layer with high coverage was confirmed by atomic force microscopy. The strong interactions between GO-ODA and P3HT were examined with UV-Vis spectrophotometry and X-ray photoelectron spectroscopy. Electrochemical and electrochromic investigations revealed that the GO-ODA layer greatly improved the long-term cyclability of the P3HT film. These findings imply that the GO-ODA complex has a significant role in creating stable EC cycling, due to its strong interaction with the P3HT film.