

## Scalable fabrication of deoxygenated graphene oxide nanofiltration membrane by continuous slot-die coating

김지훈, 최연규<sup>1</sup>, 강준혁<sup>1</sup>, 김대우<sup>1,†</sup>  
연세대학교; <sup>1</sup>연세대학교 화공생명공학과  
(audw1105@yonsei.ac.kr<sup>†</sup>)

Recently, graphene-oxide membranes have received important attention and various techniques have been used such as vacuum filtration, spin-coating, bar-coating methods. All these coating methods remaining coating fluid and contamination lead to damages in product quality with raw material waste. So in this study, scalable and continuous fabrication of the GO membrane is demonstrated by using a slot-die coater with 6 mm/s of coating speed. The thickness of the GO membrane is controllable in a hundred-nanometer scale depending on the concentration of GO solution and substrate morphology. Moreover, the GO membrane preserves its coating layer and d-spacing (6.5~7.5Å) even in aqueous solution as GO is partially reduced by NaOH treatment (so-called deoxygenated GO, dGO). Membrane performance test reveals that 99% rejection (Brilliant Blue G) to sub-nanometer-size dye molecules with pure water permeance of 30 LMH/bar. Besides, the dGO membrane is stable up to 12 bar in high pressure. In results we believe it will bring insight into the field of graphene and two-dimensional materials membrane by this continuous, no waste bringing slot die coating of dGO membrane scalable fabrication.