AFM의 electronic punch 현상을 이용한 다층 유기막의 두께 측정

김영훈*, 이정진[1], 이종협[1]
광운대학교 화학공학과; [1]서울대학교 화학생물공학부
(korea1@kw.ac.kr*)

To measure the thickness of SAMs, ellipsometry using a p-polarized laser beam is commonly used, which provides indirect information on the entire surface. Herein, a direct method for estimating the thickness of multilayered thiolated-Au films using atomic force microscopy (AFM) oxidation is described. When a bias voltage is applied to thiolated-Au films, the sulfur-gold bond is readily cleaved via a desorption procedure, and the nanoexplosion through electron tunneling occurs at the nano-contact between the probe tip and surface. A multi-step uncovered layer is obtained, which can be used to estimate the thickness of each layer (organic and gold). This procedure is referred to as “electronic punch” of AFM, and is applicable to thiolated-Au films. Performing a direct sampling at the specific point in a SAM surface is similar to a biopsy in the field of medicine, and offers more precise information regarding the surface, compared with indirect measuring methods.