

Angular distributions etch products from the bottom substrate in fluorocarbon plasmas

이진관, 이겨레, 민재호, 문상흡*¹
서울대학교 표면공학연구소, ¹서울대학교 응용화학부
(shmoon@surf.snu.ac.kr*)

The angular distributions (AD) of etch products sputtered from the bottom substrate in fluorocarbon plasmas were investigated experimentally by using a Faraday cage and a hemisphere-shaped substrate holder, which are specially designed for an effective observation of redeposition phenomenon. When ions are incident on the bottom substrate, which is a primary target, etch products are sputtered from the bottom. A fraction of the etch products are eventually redeposited on the surface of secondary SiO₂ targets, which are fixed at different positions to the hemisphere-shaped sample holder. The redeposition rate is estimated from the difference in the thickness of the secondary target between independent experiments with and without the bottom substrate. The ADs obtained in this study were significantly different from those predicted by simulation-based cosine-like functions. The ADs were also strongly dependent on the bottom substrates, such as SiO₂, Si, and fluorocarbon polymer, and on the energy of ions incident on the bottom substrate. The reason for the characteristic dependence is that the redeposition rates are affected by the amounts, the sticking coefficients on the secondary target, and the energy of etch products sputtered from the bottom.