Effect of the surface free energy of polymer substrates on the behavior of protein immobilization through layer-by-layer technique

정진석, 최호석*, Shen Tang
충남대학교
(hchoi@cnu.ac.kr*)

Surface free energy of polymeric substrates including PMMA, PS and PC was studied with RF O2 plasma treatment and water washing for immobilization of protein through LBL technique. Uniform hysteresis of DI water contact angle after plasma treatment and followed by water washing was found on PS surface rather than PMMA or PC. XPS result revealed that washing by water may change the plasma generated functionalities through solvent effect, which may readily formed on oxygen containing groups such as C=O and O-C=O. The surface free energy through acid-base method revealed Lewis base component on PS was less affected than PMMA and PS due to the weak solvent effect. During LBL coating of polyelectrolyte, solvent effect has less possibility on PS, which made better electrostatic bonding of the positive and negative polyelectrolyte. The above findings may contribute in choosing substrate for better effect of protein immobilization.