

**Imaging analysis of diffusive adsorption of a protein to nano-pore silica particles by using confocal laser scanning microscopy**

김민영, 서창우, 이병국, 김호건, 이은규\*  
한양대학교 화학공학과  
(eklee@hanyang.ac.kr\*)

The effect of pore size of silica resin on protein adsorption was determined by equilibrium constant and maximum protein adsorption calculated from Langmuir equation. As the pore size was increased from 2.2 nm to 45 nm, the BSA adsorption capacity increased from 16.8 to 84.3 mg/g-silica, the equilibrium constant was increased from 2.6 to 9.4 mg/ml, and fluorescence intensity also increased. From the pH effect on BSA adsorption, we found the silica resin was a typical cation exchange resin. Using confocal microscopy in combination with fluorescent protein labeling, we visually analyzed in situ the protein adsorption kinetics to nano-pore particles. The protein adsorption occurred primarily on the outer surface of the silica resin with small pore size. We concluded that minimum pore size of ca. 25 nm was required to sufficiently adsorb BSA of which the Stoke's diameter was 5-6 nm.