

## PE6

### Electrochemical Study on the Lateral Diffusion of Monolayer at the Air/Water Interface

공기/물 계면에서의 단분자막의 수평확산에 관한 전기화학적 연구

Young Soo Kang

Department of Chemistry, Pukyong National University

Lateral diffusion of alkylferrocene derivative monolayers at the air/water interface was studied with electrochemical method using microline electrode. The microline electrode was fabricated by gold deposition on the bare glass surface and the monolayer assembling with octadecyltrichlorosilane on the glass surface and octadecylmercaptan on the gold surface, respectively. The fabricated electrode was snapped into two parts before experiment. The cyclic voltammograms obtained from the monolayer at the air/water interface showed a diffusion controlled redox peak separation as greater than 80 mV. The linear increase of peak current with increasing the root square of scan rate also indicated a diffusion controlled system of the cyclic voltammograms. The diffusion constants of alkylferrocene at the air/water interface was increased with increasing alkyl chain length of ferrocene derivatives. This is interpreted as the position of the hydrophilic headgroups of ferrocenes with respect to the air/water interface was shifted upward for the longer alkyl chains because of greater hydrophobic entanglement. The linear decrease of the diffusion constant of ferrocenes with decreasing mean molecular area is explained by the decreasing free volume of the moving headgroup. This is well supported by the supplementary data from pressure-area isotherm and Brewster Angle Microscopic experiments. Also the different functional groups of ferrocene derivatives such as carboxamide, ester, carbonyl, alcohol are comparatively studied with electrochemistry.