The optical characterization of surface-bound Cu/Zn superoxide dismutase (SOD1) by surface plasmon resonance

강태욱, 홍수린, 김영훈, 최인희, 김윤정,
성정준[1], 이정상[1], 한지숙, 이종협*
서울대학교 화학생물공학부;
[1]서울대학교 의과대학
(jyi@snu.ac.kr*)

The optical characterization of surface-bound Cu/Zn superoxide dismutase (SOD1) by surface plasmon resonance (SPR) measurements is described. Both time- and angle-resolved SPR curves were recorded before and after the immobilization of Cu/Zn superoxide dismutase (SOD1). SPR signals of the urea-driven denaturation and renaturation of the tethered SOD1 were generated that, unlike the upright shift in SPR curves of a bare Au thin film, the exposure to a urea solution causes denaturation of SOD1, which shifts the minimum in the SPR curve to a larger angle without any change in reflectivity at the resonant angles (□SPR) for different urea concentrations. The differential reflectivity at ((Rmin/Ro)) increases sigmoidally as a function of urea concentration and becomes saturated at concentrations above 4 M. Assuming a two-state model for the denaturation of SOD1, the Gibbs free energy change for the denaturation of SOD1 on the Au surface is estimated to be 1.8 0.7 kcal/mol.