Application Note

CD-0018

Measurement of protein film samples in vacuum ultraviolet region by using J-1500 Circular Dichroism (CD) spectrometer

Introduction

CD spectroscopy is considered as an essential tool to analyze the structure of protein samples. CD spectra reflecting the secondary structure of protein are usually observed from UV region below 260 nm to the vacuum ultraviolet region. Nowadays, it has been reported as an example that by CD instrument utilizing synchrotron radiation the protein film sample was successfully measured down to around 140 nm*. CD analysis by using synchrotron radiation is a very effective method to measure CD in vacuum ultraviolet region, however, it is not easy since it requires a very special facility.

JASCO Model J-1500, having the most updated electric system using the latest digital lock-in detection capability, the further improved optical system with higher light through-put and N_2 purge function with higher efficiency which was developed based on flow simulation technology, enables to achieve high S/N CD measurement even in vacuum ultraviolet region. This note shows the analysis example of protein film sample in vacuum ultraviolet region by using J-1500 CD spectrometer.

Keywords: Vacuum ultraviolet, CD, protein, film

Measurement condition

Instrument:	J-1500 CD spectrometer	Data interval:	1 nm
Response:	4 sec	Spectral bandwidth :	1 nm
Scan speed:	20 nm/min	Accumulation:	4 times

Results

Protein sample in aqueous solution was dropped on the quartz plate and then evaporated to form a film on the quartz plate. For 4 different kinds of protein film samples, CD and absorbance were measured in 250-163 nm region. Obtained CD and absorbance spectra are shown in Fig. 1. CD spectra of Myoglobin with rich Alpha-helix, Lysozyme with α-helix and β-sheet, Concanavalin A with rich β-sheet and Trypsin inhibitor with rich random structure reflect the structural characteristics of each sample.

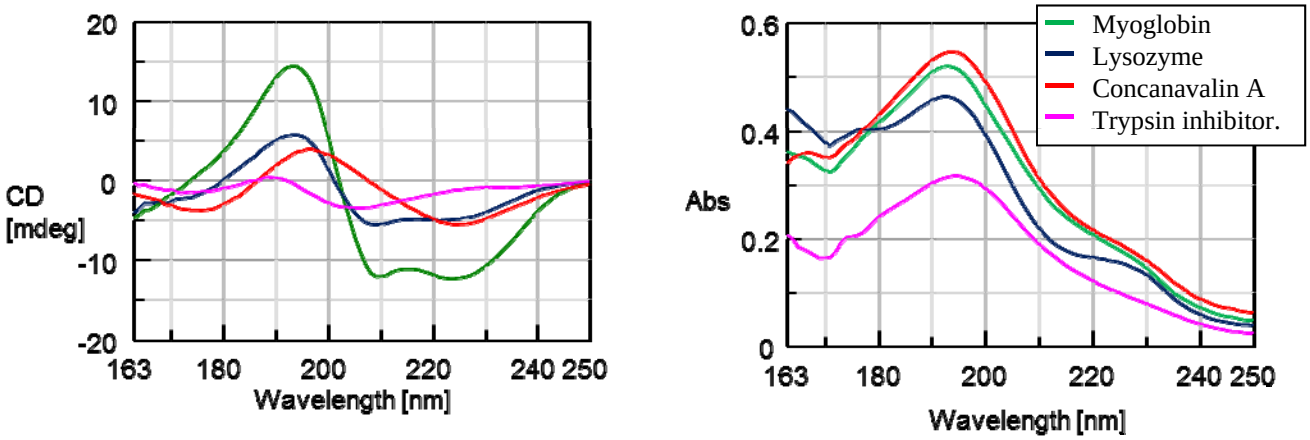

Fig. 1 Vaccum ultraviolet CD/Abs.spectra of protein film samples

Reference

* Modern Techniques for Circular Dichroism and Synchrotron Radiation Circular Dichroism spectroscopy, B. A. Wallace and R. W. Janes (Eds.), IOS Press, 2009, p 43.

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