

Hydration Structure of Poly(2-methoxyethyl acrylate) Investigated by Far Ultraviolet Spectroscopy

Yurika Nakajima,¹ Nami Ueno,¹ Yusuke Morisawa,² Shigeaki Morita*¹

¹Osaka Electro-Communication University, ²Kindai University (smorita@isc.osakac.ac.jp)

Summary: An attenuated total reflection far ultraviolet (ATR-FUV) spectrum in the 120-200 nm region of a hydrogel of poly(2-methoxyethyl acrylate) (PMEA) was successfully obtained. A spectral shape of the hydrogel shows somewhat different from that of dried polymer.

Introduction: PMEA shows excellent blood compatibility.^{1,2} Three types of hydrating water in PMEA, i.e., non-freezing water, freezing bound water (or intermediate water) and freezing water, were found using differential scanning calorimetry (DSC).^{1,2} Hydration structures of the three types of hydrating water were revealed by means of attenuated total reflection infrared (ATR-IR) spectroscopy.^{3,4} In the present study, hydration structure of PMEA was investigated using ATR-FUV spectroscopy.⁵

Methods: All the FUV spectra were measured by using an FUV monochromator purged with nitrogen gas and equipped with an internal reflection element (IRE).⁵ A liquid or a solid samples were placed on the surface of the IRE during the measurement.

Results and Discussion: Figure 3 shows ATR-FUV spectra of (a) water, (b) dried PMEA and (c) hydrated PMEA. Spectral variation of the PMEA induced by hydration will be discussed in detail.

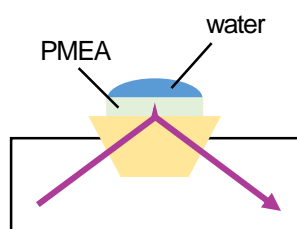


Figure 1. Schematic illustration of the ATR-FUV spectroscopy

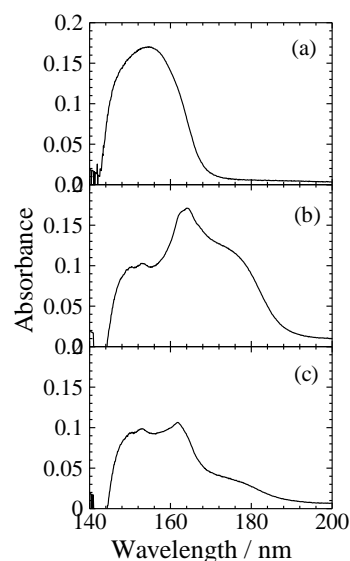


Figure 2. ATR-FUV spectra of (a) water, (b) dried PMEA and (c) hydrated PMEA.

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