

## Molecular Structure Analysis in a Dip-Coated Thin Film of Poly(2-perfluorooctylethyl acrylate) by Infrared Multiple-Angle Incidence Resolution Spectrometry

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**ABSTRACT:** Infrared multiple-angle incidence resolution spectrometry (IR-MAIRS) has been employed to study molecular orientation in a thin film of poly(2-perfluorooctylethyl acrylate) (C8FA) coated on a Si substrate. Since the coated C8FA film exhibits a highly effective water and oil repellency, the structure–property relationship has intensively been studied mainly by use of X-ray diffractometry (XRD) thus far. Regardless, XRD provides details of molecular structure only for the crystallized parts in the film, and as a result a limited region of the perfluoroalkyl group is selectively analyzed. To overcome this analytical limitation, IR-MAIRS has first been employed for analysis of a polymer thin film coated on a solid substrate. The discussion after the IR-MAIRS measurements coupled with XRD analysis provided details not only in the polymer thin film but also about structure of the substrate surface, through which a structure determination factor of the polymer film has been revealed.