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Solvent driven polymorphism in Langmuir and Langmuir Schaefer film of Poly(vinylidene fluoride)

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Abstract

Ultrathin film of Poly(vinylidene fluoride), PVDF is formed by Langmuir technique using different solvents (good and swelling) as spreading agents at the air-water interface. Surface manometry on PVDF film shows that the lift-off area of the polymer depends on the nature of the solvent. Surface potential-area per monomer isotherm of the PVDF film shows a negative (positive) potential for good (swelling) solvents. Brewster angle microscope studies show that the textures of the PVDF film are found to be largely homogeneous for the good solvents in contrast to swelling agents. Further, multilayers of PVDF were transferred onto silicon substrates using Langmuir-Schaefer method and characterized using grazing incidence x-ray diffraction, Fourier transform infrared spectroscopy and field emission scanning electron microscopy techniques. Analysis of the signature peaks yield evidence for the occurrence of a relatively larger fraction of polar β phase of PVDF film formed using good solvents.

Keywords:

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