【T-20】

Growth of SiO_2 Films on Flexible Plastic Substrate

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Flexible plastic components are being increasingly sought after for applications in a variety of technical fields. The reasons for this are impact resistance, light weight, thickness and conformability, and most importantly cost.[1] Specially, transparent barriers, such as SiO_2, against oxygen and/or water vapor permeation through polymers are the object of increasing interest in the food and pharmaceutical packaging industries, and more recently in encapsulation of organic-based displays. However, deposition of thin film on plastic is a problem, Firstly, polymer are porous in microstructure, resulting in adsorption of gas and water from the air that will then desorb in a vacuum during deposition. Secondly, thermal expansion of polymer is remarkably larger than the coated film that, in general, are inorganic layers. Thirdly, polymer cannot be coated at an elevated temperature order to obtain hard coating as done with glass substrates. Therefore, depositing a coating on raw polymer results in either a non-adherent layer that cracks from thermal shocktest, or a soft surface that is easily scratched.[2] In the phase of this study, the influence of SiO_2 film grown on flexible plastic substrates have been investigated. and then is designed to overcome clarify the drawbacks of flexible plastic substrates. We compared to the glass coating processes, produced by RF sputtering and electron beam evaporation on plastic film is limited by some technical and economic factor. describes the properties of SiO_2 single layer on PET(polyethylene terephtalate), PES(Poly Ether Sulfone) and hard coating PET. we ues Scanning Electron Microscopy (SEM) and Atomic Force Microscope (AFM) to characterize these deposits

[Reference]

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