Poster Presentation

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Thin film of organic compound over substrate in thermal gradient

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Fabrication of a thin film of organic electronics materials is very important for the preparation of effective optoelectronic devices [1]. Therefore, fundamental researches about deep understanding of role of molecular structure and supramolecular organization of organic compounds in the formation of preferably oriented thin film over a substrate are much needed. Further, impact of external constraints like rigid wall (substrate) or thermal gradient on the occurrence of polymorph is also equally required. Crystallization of organic compounds on a solid surface can leads to stabilization of one particular polymorphic phase of the compound or formation of a new polymorphic phase [2], termed as substrate induced phase (SIP). In compare with conventional methods like spin coating or drop casting for the preparation of thin film, the use of thermal gradient method can be used to enhance the supramolecular order in the thin film. Hence use of this technique in obtaining of large uniaxially oriented domain over a substrate is recent focus [3].
In this regards, a technique of crystallization of different organic compounds, for example, resorcinol, in a thermal gradient over a glass substrate has been performed. Role of molecular and crystal structure of the compound, thermal gradient magnitude, growth rate and polymorphism in formation of preferably oriented or aligned thin film have been investigated. A detail structural and orientation analysis of the thin film over the substrate has been performed by polarized optical microscopy, X-ray diffraction measurement and pole figure analysis. It was observed that in case of resorcinol, only beta form is appeared to crystallize over a glass or PDMS coated glass substrate in a thermal gradient. A well oriented crystals over the substrate were observed and appeared to be aligned relative to the temperature gradient.
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