

the chiral properties of the molecules on the Au(111)-surface and if it possible to prepare enantiomeric pure surface which can be used for catalysis or sensing applications.

O 44.13 Wed 17:00 Poster C

**Subphase dependent (2D) ordering in monolayers of amphiphile molecules** — ●SASKIA SCHMACKE<sup>1</sup>, BERND STRUTH<sup>2</sup>, LUTZ WIEGART<sup>3</sup>, HENRI GLEYZOLLE<sup>3</sup>, and METIN TOLAN<sup>1</sup> — <sup>1</sup>Experimentelle Physik E1a, Universität Dortmund, Otto-Hahn-Str. 4, D-44221 Dortmund — <sup>2</sup>Deutsches Elektronen-Synchrotron DESY, Notkestr. 85, D-22607 Hamburg — <sup>3</sup>ESRF, 6 rue Jules Horowitz, BP 220, F-38043 Grenoble Cedex

Layers of amphiphile molecules on liquid subphases show a different phase behaviour depending on environmental parameters like temperature, surface pressure and subphase. Gaseous, liquid and solid phases are observable. In this work the influence of different subphases on the crystal structure of the Phospholipid monolayers DPPA (dipalmitoyl-phosphatidic acid) and DPPC (dipalmitoyl-glycerophosphocholine) was investigated. The crystal structure was determined by using Grating Incidence X-Ray Diffraction technique (GID) at the beamline ID10b, ESRF. The obtained diffraction patterns are analysed in two steps: First the information about the 2D unit cell of the crystalline phase, e.g. lattice spacings, lattice type (2D Bravais lattice) and the deformation of the lattice was determined. Secondly the intensity dependence on wave vector transfers perpendicular to the surface was analysed leading to information about the scatterer itself, like chain length, diameter, tilt angle and orientation within the lattice of the molecules forming the monolayer. The calculation of the differential cross section using a cylinder model for the lipid molecules shows very good agreement with the experiment for all subphases.

O 44.14 Wed 17:00 Poster C

**Complex Structures in Multilayer Polymer-Blends on Glass Substrates** — ●HUBERTUS MARBACH, FLORIAN MAIER, and HANS-PETER STEINRÜCK — Universität Erlangen-Nürnberg, Lehrstuhl für Physikalische Chemie II, Egerlandstraße 3, D-91058 Erlangen, Germany

Recently, multicomponent polymer systems have attracted attention due to their capability to form a wealth of structures in thin films on various substrates. The three-dimensional morphology of these structures depends on the phase separation processes of the polymers involved, and on the corresponding experimental parameters and procedures, such as the polymer mixture, the spin coating parameters, thermal treatments, etc.. In the present paper we focus on layer systems of a mixture of polymethylmethacrylate and polystyrene (PMMA/PS) on glass slides. The polymer-blend films were prepared by a spin-coating technique and interjacent thermal treatments. The resulting rich variety of complex structures was characterized by means of atomic force microscopy under ambient conditions. In addition, the exposure of the PMMA/PS films to cyclohexane leads to the selective dissolution of PS. This enables the identification of the features attributed to PS (or PMMA) and serves as the starting point for the generation of even more complex structures. The main findings of systematic measurements will be presented and the underlying mechanisms will be discussed.

O 44.15 Wed 17:00 Poster C

**Site selective growth of organic molecules** — WENCHONG WANG<sup>1</sup>, DINGYONG ZHONG<sup>1</sup>, JIA ZHU<sup>1</sup>, FELIX KALISCHEWSKI<sup>2</sup>, ●CHUAN DU<sup>1</sup>, ANDREAS HEUER<sup>2</sup>, HARALD FUCHS<sup>1</sup>, and LIFENG CHI<sup>1</sup> — <sup>1</sup>Physikalisches Institut and Center for Nanotechnology (CeNTech), Universität Münster, 48149 Münster, Germany — <sup>2</sup>Institut für Physikalische Chemie, Universität Münster, 48149 Münster, Germany

Devices with active organic layers are of great interest recently due to their less energy consumable process and potential low cost. However, the future success of these interesting materials in applications will strongly depend on fabrication processes that include patterning. We present a general method to pattern organic molecules by template-directed nucleation control using organic molecular beam deposition. Fully sites selective growth of organic molecules can be controlled at optimized conditions. We use simple Lennard-Jones (LJ) pair potentials to mimic the molecular interactions. The simulation results have good agreements with experimental data. This technique can be applied to fabricate large area uniform organic devices.

O 44.16 Wed 17:00 Poster C

**Molecules can climb : Islands formation during organic mo-**

**lecular beam epitaxy** — DINGYONG ZHONG<sup>1,2</sup>, ●RUIFEN DOU<sup>2</sup>, WENCHONG WANG<sup>2</sup>, HARALD FUCHS<sup>1,2</sup>, and LIFENG CHI<sup>2</sup> — <sup>1</sup>Institut für Nanotechnologie, Forschungszentrum Karlsruhe, 76021 Karlsruhe, Germany — <sup>2</sup>Physikalisches Institut and Center for Nanotechnology, Universität Münster, Wilhelm-Klemm-str. 10, 48149 Münster, Germany

The epitaxial growth of organic thin film has been studied. Islands with sharp edge, flat top and nearly uniform height are formed on metal crystalline substrate at certain range of growth temperatures. To understand the mechanism of the islands formation, a model is proposed in which the binding energy of molecules at the step edge is various at different terraces due to the lattice mismatching of the first monolayer and the three-dimensional island beyond the first monolayer. Both the ascending and descending interlayer transport processes are considered. The numerical simulations of the rate equations based on this model are consistent well with the experimental results.

O 44.17 Wed 17:00 Poster C

**Molecular flexibility as a factor affecting the surface ordering of organic adsorbates on metal substrates** — ●S. SOUBATCH, R. TEMIROV, and F. S. TAUTZ — International University Bremen (Jacobs University Bremen as of spring 2007), Bremen, Germany

The effect of molecular flexibility on the surface ordering of complex organic adsorbates is explored by mean of LEED and STM, using DH4T and mixed DH4T-tetracene phases on Ag(111) as model systems. Above 273 K, DH4T forms a nematic liquid crystalline phase. At 273 K, a reversible phase transition to a long-range ordered, point-on-line coincident phase is observed. However, this ordered state is still affected substantially by the flexible nature of DH4T, which materializes in a large number of local structural defects. If traces of DH4T are co-evaporated with tetracene, inclusions of a 1:1 stoichiometric DH4T-tetracene phase are found in a tetracene/Ag(111) matrix. In this mixed phase, tetracene and the two surface enantiomers of DH4T arrange in a complex stripe structure. The mixed phase shows a higher degree of order than present at the pure DH4T/Ag(111) interface, which also lacks chiral organization. The addition of tetracene molecules as structural templates stabilizes certain conformations of DH4T and thus, by balancing its structural flexibility, allows the surface-induced chirality of DH4T to become a decisive factor in determining the structure of the mixed phase.

O 44.18 Wed 17:00 Poster C

**STM Observation of Molecular Chains consisting of Mn<sub>6</sub>Cr Single Molecule Magnets on Highly Ordered Pyrolytic Graphite (HOPG)** — ●AARON GRYZIA<sup>1</sup>, ARMIN BRECHLING<sup>1</sup>, WIEBKE HACHMANN<sup>1</sup>, MARC DAVID SACHER<sup>1</sup>, ULRICH HEINZMANN<sup>1</sup>, MAIK HEIDEMEIER<sup>2</sup>, and THORSTEN GLASER<sup>2</sup> — <sup>1</sup>Faculty of Physics — <sup>2</sup>Faculty of Chemistry, University of Bielefeld, D-33615 Bielefeld

We report on the preparation and characterization of Mn<sub>6</sub>Cr-Single Molecule Magnets<sup>1</sup> on a HOPG(0001) surface.

The Mn<sub>6</sub>Cr-molecules showed 1D molecular arrangements with many interesting features, such as the occurrence of discrete kink angles in the molecular chains of 30°, only two different molecular orientations, the orientation of the chains along the main crystal axis of HOPG and a much larger molecule-molecule distance than expected from the van der Waals radii of the molecules. The orientation of single Mn<sub>6</sub>Cr-molecules in the chain and the orientation of the chain, in respect to the main crystal axis of the HOPG substrate, shows a clear dependence. Segments of the chain with the same orientation of the Mn<sub>6</sub>Cr-molecules are parallel to the main crystal axis and parts with an alternating molecular orientation are tilted by 30° in respect to this axis, which is a clear evidence for molecular-substrate interactions.

The observed structures appear to be a very promising model system to study the competition between molecule-molecule interactions and substrate-molecule interactions.

<sup>1</sup> T. Glaser et al., *Angew. Chem.*, **118**, 6179-6183 (2006).

O 44.19 Wed 17:00 Poster C

**Valence electronic structure of the PTCDA/Au(111) interface** — ●JOHANNES ZIROFF, SIMON HAME, FRANK FORSTER, AZZEDINE BENDOUNAN, and FRIEDRICH REINERT — University of Würzburg, Experimental Physics II, Am Hubland, 97074 Würzburg, Germany

We present angular and energy resolved UPS spectra of PTCDA (3,4,9,10-perylene-tetracarboxylic-dianhydride) on the Au (111) surface from the sub-monolayer range to thick films. Using the Shockley state as a probe, one can investigate the substrate-adsorbate interac-