ness of the film. Such morphological changes were not observed on the PMMA film when the samples were continuously kept in the liquid nitrogen for a few hours. The changes in the morphology could be attributed to the release of thermal stresses developed during the plasma polymerisation of MMA, coupled with entrapping of gases, which cause thermal strains during the repeated cryo-thermal cycles.

PS12.02.16 DEPOSITION, MOLECULAR ORGANIZATION AND FUNCTIONAL ACTIVITY OF IgG LANGMUIR FILMS A.Tronin[1], T.Dubrovsky[2] [1]Institute of Crystallography, Leninsky 59, Moscow 117333, Russia [2]Bakh Institute of Biochemistry, Leninsky 33, Moscow 117071, Russia

Monolayers formed at the air-water interface and covalently immobilized on solid supports were studied by means of ellipsometry, time resolved fluorimetry, nanogravimetry and immunology testing. The model of the film molecular packing has been put forward, according to which the molecular orientation depends on the surface pressure. At the pressure below 20 mN/m the molecules are oriented parallel to the surface, when compressed up to 35 mN/m the molecules take perpendicular position, with their Fab fragments oriented preferentially outside the film. Within the range 20 mN/m<<35 mN/m the molecular inclination angle increases monotonically from 0 to 90. The pattern of the orientation-pressure behavior for transferred monolayers is almost the same showing that the film molecular structure does not change upon deposition onto the solid activated substrate. Complex structures of protein A sublayer-Langmuir film of IgG have been obtained and studied as well. The problem of protein monolayer stability has been addressed, and partial unfolding of the protein globule has been suggested to be an origin for high molecular surface activity. The dependence of immunological activity of IgG films on the packing parameters has been studied.

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PS12.02.17 TECTONIC SETTING AND CHARACTERS OF RAS SHAIT PODIFORM CHROMITE, EASTERN DESERT, EGYPT. Nadi A. Saad, Department of Geology, Faculty of Science, University of Alexandria, Egypt

The chromite deposits of Ras Shait area occur in an ophiolite complex as isolated lenses, pods, nodules or as disseminated grains mainly enclosed in serpentinites and talc carbonates. Incomplete sequence of the ophiolite complex is recorded in the studied area. Metamorphic peridotites and the overlying foliated gabbro are the main units, while sheeted dykes and massive basalts are encountered as limited exposures. The peridotite and associated chromite mineralization display features characteristic of the Alpine-type. The Ni/Co and MgO/SiO_2 ratios of the serpentinites and talc carbonates, beside their petrographic characteristics suggest that the parental rocks were harzburgite-lherzolite. The main opaque constituents in the studied area is chromite and its alteration products (ferritchromite and chromian magnetite). Ilmenite, titanomagnetite and rutile are present in subordinate amounts. Pyrite, chalcopyrite and pyrrhotite are rare. The associated gangues are antigorite, lizardite, talc, magnesite, calcite, fuchsite and kaemmererite. The microprobe analysis of the zoned chromite grains shows chemical compositional variations from the core to the rim and reveal that the alteration zones of chromite crystals are enriched in Fe and Ni and depleted in Al, Mg and Mn. This alteration is concomitant with the serpentinization process which affected the ultramafic masses. A plate tectonic model is proposed to explain the genesis of Ras Shait chromites. The ophiolite complex, with its associated chromite, are considered to be a mass of oceanic lithosphere obducted over continental crust. During obduction, the original chromite layers were subjected to intense tectonic disturbances with the result that the chromite deposits were dismembered and variously rolled giving the present pod form.

PS12.02.18 INTERFACE ROUGHNESS CORRELATIONS IN Ge/Si/Si1-xGex QUANTUM WELL HETEROSTRUCTURES. Y. Yamaguchi, P. M. Reimer, J.H. Li, O. Sakata, H. Hashizume, Tokyo Institute of Technology

We examine roughness correlations between interfaces in a simple Ge/Si/Si1-x Gex heterostructure as a function of Si layer thickness. Recently it has been found [1] that the photoluminescence (PL) spectra from quantum wells (QW) of Ge/Si/Si1-xGex (with x less than 0.4) can be strongly perturbed by growing several Ge-rich monolayers on top of a Si layer which tops the QW. No PL perturbation is observed for Si thicknesses greater than about 1000 nm, and the perturbation saturates for Si thicknesses less than about 30 nm.

We collected x-ray diffuse scattering data at glancing angles from solid-source MBE grown Ge/Si/Si1-xGex heterostructures on Si (100) substrates, with a variety of Si layer thicknesses. Using techniques described in another session (see the presentation by P. M. Reimer, et. al.) we modelled and fit parameters to find in-plane and inter-layer roughness correlations as a function of Si layer thickness. Parameters may be compared with recent results from multilayers on Si (111) substrates (see the presentation by J.H. Li, et. al.).

[1] see N. Usami, H. Sunamura, T. Mine, S. Fukatsu, Y.Shiraki, J. Cryst. Growth, 150, 1065 (1995).

PR12.02.19 STRUCTURE OF ULTRATHIN FILMS Ni/Au(001) AND Au/Ni(001): A STUDY USING MOLECULAR-DYNAMICS SIMULATION. O.V.Lysenko (Volf), A.A.Katsnelson, A.E.Moroz, V.S.Stepanyuk, O.S.Trushin. Physics Department, Moscow State University, Russia.

Growth of the ultrathin films Ni on substrate Au(001) and Au on substrate Ni(001) at room temperature are studied by means of molecular- dynamics simulation using Lennard- Jones potential.

From structural Ni/Au(001) and Au/Ni(001) data can be deduced: The first epilayer Au exhibits fcc Au(111) film. Larger radius of Au atoms (by 16%) in comparison to Ni atoms gives rise to the orientation change of this layer relatively to substrate. If positions of Au atoms correspond to (111) lattice plane than greater number of ordering particles of Au coincides with positions of Ni atoms. The structure of the second epilayer is the same of the first one.

In process of Ni atoms adsorption on substrate Au(001) Ni atoms are placed upon interatomic hollow of substrate topmost layer. Besides, due to smaller radius of Ni atoms, they do not touch each other. Moreover, part of peaks of pair correlation function for the first epilayer is asymmetrical. The atomic positions in the next layers are characterized by lots of defects, but basic lattice plane type is the same of topmost layer of substrate. In this case interatomic distances Ni-Ni are smaller than ones in substrate Au-Au by 3-4% (but not by 16%) as in case Au/Ni(001). The weak diffusion of Ni atoms into substrate Au is observed.