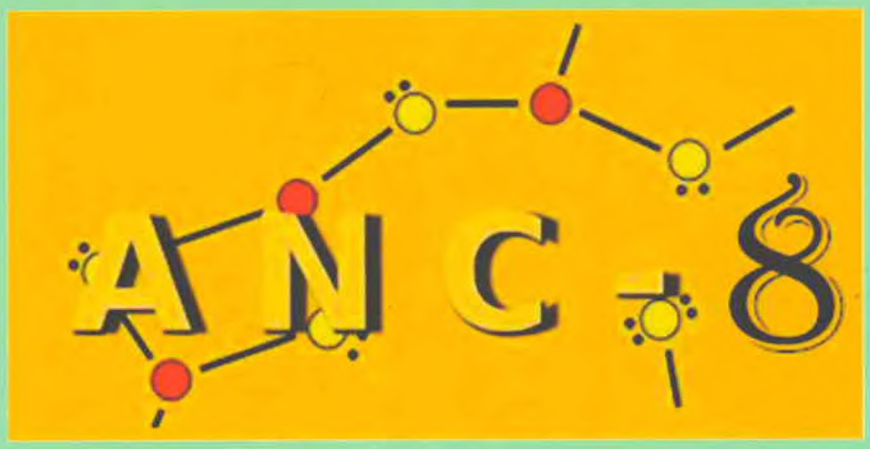

Abstract Book

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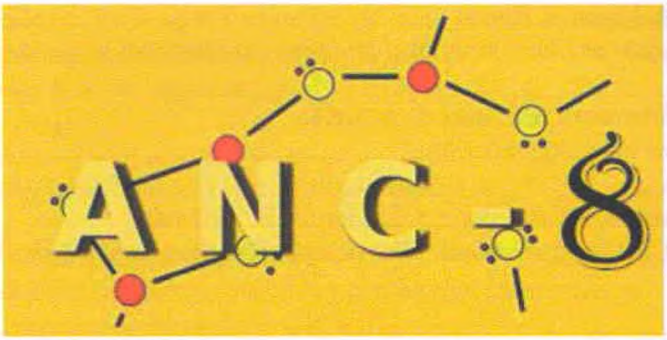

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However, the uses of standard fitting models which are presented into ellipsometre data base give not sufficient accuracy. Individual fitting model based on the well-established exponential absorption inside the band gap tail and Tauc fundamental absorption was developed.

Dynamic Taylor cone formation on chalcogenide films surface

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We investigated the formation of surface reliefs during the interaction of an electron beam (EB) with $Ge_9As_9Se_{82}$ films. The films (thicknesses 2μm) were irradiated by an EB using a scanning electron microscope (Tescan, model VEGA) in dose range $G=9.3\times10^3$–9.3×10^7 μC/cm^2. A square lattice of dots was exposed on the surface of films. Surface relief of the film was studied by atomic force microscope (Bruker, model ICON). It has been detected that three distinct types of surface features are formed in that dose range. In dose interval 9.3×10^3–2.8×10^5 μC/cm^2 the EB induces the formation of cones with a Gaussian profile. The cone height is 250–270 nm. In dose interval 5.6×10^5–1.9×10^6 μC/cm^2 the cone surface protrudes upward along the surface normal and becomessharper, eventually evolving into a Taylor cone. With increasing exposure dose its height increases from 380 nm to 560 nm. In dose interval 4.6×10^6–9.3×10^7 μC/cm^{2}a combined shape relief is formed. We observe the formation of a crater with depth 530 nm and a giant Taylor cone (750-2510 nm) on the edge of each crater. The formation of the surface relief is caused by structural changes in the film and the emergence of the space charge region (SCR) during the interaction between $Ge_9As_9Se_{82}$film and EB. We find that several distinct types of surface features can be formed, depending on density and size of deposited charge into SCR. Taylor cones formed during electrohydrodynamic material flow, which occurs in SCR when certain instability limits are met. We find that development of electrohydrodynamic instability on the film surface occurs when the pressure forces of the electric field into space charge region exceed the pressure of surface tension forces. We believe that observed phenomena are interesting not only from fundamental but also applications perspective.

Influence of size factors on the formation of surface relief in amorphous chalcogenide films during periodic charge deposition by electronic beam

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Changes in shape and parameters of electron beam (EB) induced surface relief of chalcogenide films have been investigated depending on the film thickness and distance between the irradiated areas. For measurements we used $Ge_9As_9Se_{82}$ film with thicknesses 3.0μm, 3.5μm, 4.5μm on sapphire substrates. We found that the film thickness, the distance between irradiated areas and charge removal rate affects characteristics of surface relief formation in the high dose regime. Significant change in surface relief is observed in the dose interval $4.6*10^6$–$9.3*10^7$ μC/cm^2 when distance between irradiated areas less than 6μm decreases. At dose $9.3*10^7$ μC/cm^2 this relief consists from craters with two different depths (250nm, 800nm) and giant (2.5μm) spires formed at the edge of the big crater. Shallow and large craters appear in alternating