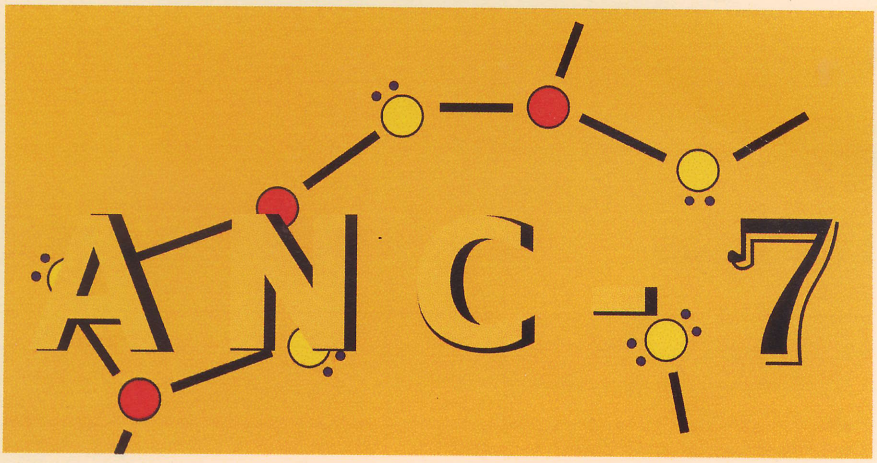

Abstract Book

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relaxation movement. According to the existing views of the speed of relaxation processes depends on the size of the structural elements included in the amorphous matrix and also from presence of free volumes; are accelerated with the decrease the size of the elements and increase free space. As a result of doping by samarium the relaxation contribution decreases in $As_{33.3}Se_{33.3}S_{33.4}$ but increases in $As_{33,3}Se_{33,3}Te_{33,4}$, which have been explained due to the different behavior of samarium atoms in them. In the first case, as chemically reactive element effect crosslinking and increase the dimensions of structural elements and fills the empty spaces available, and in the second case primarily accelerates crystallization and decreases the size of the structural elements.

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Photo-eged studies of arsenic sulfide crystalls and As-S glasses with realgar inclusion

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Arsenic sulphide minerals are found naturally and have been used as artists' pigments since prehistoric times. Orpiment As_2S_3 gives a yellow pigment and realgar As_4S_4 usually gives an orange-red. Recently by macro FT-Raman and energy-dependent micro-Raman spectroscopy we found the light-induced structural changes in glassy As-S system with realgar inclusion [1,2]. New observed features in the Raman spectra of As-S glass are related to transformations of As_4S_4 molecules. Being initially in the structure of glassy closed and connected with glassy network only by weak Van der Vaals forces α (β)-As_4S_4 molecules are transformed into pararealgar p-As_4S_4 form during laser illumination. The effectiveness of transformations depends mainly from photon energies used for irradiation but transformation tendency observed for all used photon energies ranged from 1.65 to 2.54 eV. Our findings are multidisciplinary and may have a significant value to play in disciplines such as natural resources, prehistoric artistic expression, archaeology, art history and chalcogenide photonics. Based on our finding of light-induce realgar-paraleargar transformation the additional related investigations [3] also found realgar degradation by different halogen lamps and a LED lamp, used in museum exhibitions are helpful to describe the photo-degradation processes in pigment[4].The light remains unique because it can neither be eliminated nor completely controlled. The red colour of the pigment based on realgar α-As_4S_4 on exposure to light transformed to pararealgar p-As_4S_4 that exhibits yellow colour. Based on our investigations, the light necessary for viewing a work of art with realgar pigments, can damage the artwork during 30 sec starting from with photon energies equal 1.65 eV with relatively high intensity 10^2 W/cm^2. Process of light induces polymorph transformation on air is accompanies with formation arsenolite As_2O_3 and finally lead to whitening of realgar. The process is not completely clarified so far. Based on SRPS, XPS and surface enhance Raman and PL spectroscopy studies we found some photo-aged processes occurring on the surface of amorphous As_2S_3 film for chalcogenide photonics. In energy dependent luminescence in orpiment, realgar and glassy As-S with realgar inclusion we have found evidence of As_2O_3, As_2O_5 formation and PL band typical for substance known in general formula $As_2O_3xH_2O$. Last is showed that is why the illuminated painted with realgar places can by wet in high humidity condition. May be this finding help to give answer why some places on paintings are