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# Instrumented indentation testing and metallurgical microscopy measurements on thin amorphous chalcogenide films

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Determination of mechanical response of amorphous thin films against surface damages due to indenting force of is a great interest for practical applications, especially considering the existing knowledge of their general brittleness. Metallurgical microscopy is a widely used method in determining the hardness of different materials. In case of thin film forms this technique often faces many difficulties. In order to investigate the possibilities and limitations of applying this technique on amorphous thin films two thin film samples were prepared: three component Cu15As50Se35 film and four component Cu1As38.1Se53.5I7.4 film. The value of Vickers micro hardness was determined on the basis of the dimensions of the plastic micro-imprint of the Vickers indenter into the sample. The obtained results were then compared with those obtained by the use of more precise technique which is to date regarded as the most suitable for investigating the thin film forms: instrumented indentation testing. The micro indentations and load-displacement curves were recorded in three randomly selected points on the surface of each investigated sample, considering possible variations of mechanical properties. The results have shown significant differences in obtained values of Vickers hardness when two different indentation techniques were used. Additional effects that can influence the precision of measurements by metallurgical microscopy (pile up, indentation creep and crack formation) were detected.

## Biography

S R Lukic-Petrovic is a full Professor in the Field of Condensed Matter Physics at the University of Novi Sad, Faculty of Sciences in the Department of Physics. She is the Chair of the Laboratory for Condensed Matter Physics and the Head Organizer of the teaching process for the study module Material Physics at Master's and PhD levels. She is a member of the International Forum of Chalcogeniders. She has published more than 100 papers in international journals and has participated at many domestic and international conferences, debates and workshops. The total number of her citations is 556 and h-index is 12.

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