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DOUBLE CRUCIBLE METHOD IN THE FIBER OPTIC IMAGE GUIDES (TAPERS) MANUFACTURING

Tapered fiber optic image guides are obligatory elements in a number of electro-optical imaging systems.

They have been applied in high sensitivity and resolution radiography systems and LLLTV cameras. They allow to reduce X-ray exposure time. The high fidelity image is available on the TV monitor in real time. It will be presented the double crucible method of manufacturing preliminary fiber optic rods.

For double crucible method application we had to work out the crucible construction and method of synthesis the glass (with adequate physico-chemical properties) for core and cladding.

To improve image transmission quality of the tapers two stage draw process was applied. Special attention has been paid to different glasses recrystallization during their staying in hot tanks of the double crucible. The glass recrystallization has limited manufacturing possibilities of the fiber optic image guides with maximum high numerical aperture, close to 1 ($N \approx 1$), and currently it is under research.

Pełny tekst zostanie zaprezentowany na sesji referatów.

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MRS - Materials Research Society,
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AMORPHIZATION OF Ni/Zr BILAYERS BY ION-BEAM-MIXING

Amorphization of Ni/Zr system induced by ion-beam-mixing was studied by Rutherford Backscattering (RBS) and channeling technique. The microstructure of the mixed layer was analyzed by Conversion Electron Mössbauer Spectroscopy (CEMS) for ^{57}Fe implanted into the mixed layer. The samples were prepared by e-beam evaporation of 50 nm of Zr on $\langle 100 \rangle$ Ni single crystal. Ion-beam-mixing was performed at temperatures ranging from 77K to 500K with noble gas ions. Irradiated samples were post-implanted with $4 \times 10^{15} \text{ } ^{57}\text{Fe}$ at./cm² at 20 keV in order to allow CEMS measurements. After irradiation samples were annealed in the temperature range from 300K to 750K.

CEMS measurements revealed the formation of the amorphous Ni/Zr phase which crystallized upon annealing. RBS/channeling results demonstrate that the concentration of Zr atoms introduced into Ni by ion-beam-mixing controls the amorphization process. The structure of ion-beam induced amorphous phase is discussed in detail.

Material będzie prezentowany w formie posteru i opublikowany
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ECER'S - Third European Ceramic Society Conference,
Madrid, Spain, 13-17/09.1993

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SUBCRITICAL CRACK GROWTH IN CERAMICS WITH R-CURVE BEHAVIOUR

Some results of subcritical crack growth measurements are presented and discussed here as a function of microstructure in materials containing 84.5% Al_2O_3 and 15% ZrO_2 (in a monoclinic phase). These ceramics exhibit R-curve behaviour. It has been established that the increase of grain size causes the rising resistance to crack growth, but the increase of the thermal crack lengths and concentrations lowers the crack growth resistance.

Material prezentowany będzie na sesji posterów.
Pełny tekst wystąpienia zostanie opublikowany w materiałach konferencyjnych.

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INTERNAL THERMAL STRESSES IN ANISOTROPIC POLYCRYSTALLINE CERAMICS

The results of calculations of internal thermal stresses with finite-element method for alumina ceramics are presented. The calculations were made for three dimensional model of anisotropic polycrystalline material. The results can be used later for producing R-curve design for noncubic ceramics.

Material zostanie zaprezentowany na sesji posterów.
Pełny tekst wystąpienia będzie opublikowany w materiałach konferencyjnych.