

**AMPERE WORKSHOP ON MAGNETIC RESONANCES AND  
MICROWAVE ABSORPTION IN THE HIGH- $T_c$   
SUPERCONDUCTING MATERIALS, Poznań, Poland, 10-13/04.1994**

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**CHARACTERIZATION OF  $C_{60-x}(BN)_x$  FULLERENES BY  
INFRARED ABSORPTION, RAMAN SCATTERING AND  
ELECTRON SPIN RESONANCE**

A standard electric arc generator was used to prepare boron-nitrogen doped fullerenes. The graphite electrodes were filled with a high purity boron nitrate-BN powder of hexagonal structure. The simultaneous sublimation of carbon and boron nitrate assured high density of dopants during condensation of fullerenes. The fullerenes were investigated by Raman scattering, infrared absorption and ESR. The differences observed in ESR were the most pronounced. There were very strong lines at  $g \cong 2$  of the intensity varying with the temperature. It suggests that boron in the fullerene is bound by  $sp^2$  hybridized atomic orbitals (AO) to its three neighbors, and nitrogen by strongly deformed  $sp^3$  AO with the lone pair and both boron and nitrogen ought to be considered as p-dopants leaving a hole in the HOMO.

Material prezentowano na sesji posterów.

**AMPERE WORKSHOP ON MAGNETIC RESONANCES AND  
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**ELECTRON SPIN RESONANCE STUDY OF CHROMIUM  
IONS IN SrLaAlO<sub>4</sub> HIGH- $T_c$  SUBSTRATES**

In this paper the results of measurements of chromium doped SrLaAlO<sub>4</sub> single crystal are reported. The ESR lines were observed at X-band frequency at a temperature range from 300K to 6K. In the a-b plane of crystals two identical anisotropic centers of Cr<sup>2+</sup> were obtained. The experimental rotation pattern was compared with that computed from the appropriate spin Hamiltonian

$$H = g \beta H S + D[S_z^2 - 1/3 S(S + 1)] + E(S_x^2 - S_y^2)$$

and the following best fit ESR parameters were obtained  $g = 1.980 \pm 0.002$ ,  
 $D = 196 \pm 2 \cdot 10^{-4}$  cm,  $E = 30.8 \pm 1 \cdot 10^{-4}$  cm<sup>-1</sup>.

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**ISSRNS'94 - 2nd INTERNATIONAL SCHOOL AND SYMPOSIUM  
ON SYNCHROTRON RADIATION IN NATURAL SCIENCE,  
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**THE STEREOSCOPIC OBSERVATION OF SYNTHETIC  
DIAMOND WITH HARUTA STEREO-PAIRS OF TRANSMISSION  
DOUBLE-CRYSTAL TOPOGRAPHS**

The Haruta method of obtaining the stereoscopic effect by small rotation about the diffraction vector was used in synchrotron double-crystal topography.

The double crystal experiments were performed on 1.5 x 4 x 4 mm<sup>3</sup> slab cut from cuboctahedral synthetic diamond, in the arrangement with the asymmetrical 220 diamond reflection matched by the 331 reflection on silicon monochromator and selecting 1.0 Å radiation. The double-crystal topographs provided intense contrast in dislocation, stacking faults, growth sector boundaries and other defects, often connected with distinct interference fringes. The images were strongly angle dependant and appropriate Haruta pairs were matched from a series taken with a position on the rocking curve altered by a small value.

The pairs exhibited good stereoscopic effect on most of the defects, and on some diffraction fringes. Some other fringes did not exhibit stereoscopic effect and appeared as located on the surface of the diamond exit for the radiation. The stereoscopic effects were also compared with those obtained in single-crystal Haruta pairs in exactly the same geometry.

## **SPD - VII OGÓLNOPOLSKIE SYMPOZJUM SYMULACJA PROCESÓW DYNAMICZNYCH, Polana Chochołowska, 13-17/06.1994**

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### **LASERY ŚWIATŁOWODOWE Z NIELINIOWYM ODSPRZĘGACZEM**

W ostatnich latach wzrasta zainteresowanie nieliniowymi urządzeniami optycznymi ze względu na potencjalne możliwości ich wykorzystania m.in. w systemach optycznego przetwarzania informacji oraz telekomunikacji światłowodowej. Zastosowanie optycznie nieliniowych ośrodków w układach pasywnych jak również w laserach jest źródłem nieliniowych charakterystyk wyjściowych prowadzących do zjawisk multistabilności optycznej, pulsacji jak również chaosu.

Analizowany laser światłowodowy zawiera odsprzegacz kierunkowy, którego transmisja na skutek nieliniowości optycznej trzeciego rzędu (tzw. nieliniowość typu kerrowskiego) jest funkcją natężenia światła w rezonatorze laserowym. Nieliniowość sprzegacza i wzmocnienia światła w ośrodku aktywnym powodują, że promieniowanie lasera wykazuje różne reżimy pracy od stanu stacjonarnego do oscylacji chaotycznych.

Materiał zaprezentowano na sesji posterów.

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## XXXV KONWERSATORIUM KRYSTALOGRAFICZNE Wrocław, Poland, 27-28/06.1994

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### STECHEIOMETRIA I STRUKTURA KRYSZTAŁÓW $\text{SrLaAlO}_4$ i $\text{SrLaGaO}_4$

Podstawową trudnością w otrzymaniu monokryształów  $\text{SrLaAlO}_4$  i  $\text{SrLaGaO}_4$  metodą Czochralskiego jest znaczna różnica między składem topiącym się kongruentnie a składem stechiometrycznym. Optymalne składy roztopu dla wzrostu monokryształów  $\text{SrLaAlO}_4$  i  $\text{SrLaGaO}_4$  określone zostały przez analizę wyników otrzymanych podczas pomiarów metodą EPMA składów płytek wyciętych z monokryształów wzdłuż kierunku wzrostu. Pomimo niskiej dokładności bezwzględnej pomiaru przy wykorzystaniu tej metody udaje się uzyskać informacje o tym w którym kierunku na trójskładnikowym diagramie Gibbsa przesuwają się w trakcie wzrostu skład chemiczny kryształu, a więc i skład roztopu. Poprzez kolejne korekty składu roztopu można uzyskać stały, wzdłuż kierunku wzrostu, skład monokryształu, co odpowiada optymalnemu składowi wyjściowemu. Dokładność określenia składu chemicznego fazy topiącej się kongruentnie przy wykorzystaniu tej metody jest nie gorsza niż 0,2 % mol., co pozwala na otrzymywanie z tygla o średnicy 50 mm całkowicie przezroczystych monokryształów (bez wytrażeń i widocznych defektów) o średnicach powyżej 20 mm i długości do 100 mm.

Określone tą metodą składy faz topiących się kongruentnie wynoszą: 50 % mol. SrO, 25.75 % mol.  $\text{La}_2\text{O}_3$ , 24.75 % mol.  $\text{Al}_2\text{O}_3$  dla  $\text{SrLaAlO}_4$  i odpowiednio 47.95 % mol. SrO, 25.25 % mol.  $\text{La}_2\text{O}_3$ , 26.8 % mol.  $\text{Ga}_2\text{O}_3$  dla  $\text{SrLaGaO}_4$ .

Dodatkową trudność przy otrzymywaniu tych monokryształów stanowi silna

anizotropia prędkości wzrostu w zależności od tego na jakich płaszczyznach krystalograficznych on następuje jak również wyjątkową wrażliwość na konfigurację termiczną (położenie tygła w cewce, rodzaj dogrzewacza) i gradienty temperatury.

Przedstawione zostaną także wyniki badań strukturalnych na monokryształach otrzymanych w różnych warunkach.

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## XXXV KONWERSATORIUM KRYSTALOGRAFICZNE Wrocław, Poland, 27-28/06.1994

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### ON MELTING AND CRYSTALLIZATION OF BaCaO<sub>3</sub>

Crystallization process of BaCaO<sub>3</sub> was performed in optically heated floating zone furnace in an air atmosphere. Synthetized powder was hydrostatically pressed into a plastic form in order to produce a cylindrical rod of diameter about 8 mm and a length of 90 mm and was next sintered at a temperature 1200°C for 12 hours. In the optical furnace the ceramic rod was pulled down through a focused light region. A thin alumina (Al<sub>2</sub>O<sub>3</sub>) rod was used as a seed. The raw material hardly melt at full power of light (the temperature of melt was estimated to be above 2000°C) due to the fast evaporation of the melt. Vaporized material was next condensed on the ceramic rod above the melting zone in the form of small yellow crystallites. These crystals remained and even grew up passing down through the melting zone and therefore it was impossible to control the process in the conventional way. To prevent deformation (and cut off) of melting zone it was necessary to stop the rotation of the ceramic rod at the top as well as a crystallized material at the bottom.

As a result of such treatment a polycrystalline material with a strange pineal form similar to strobile or pineapple fruit was obtained. In a central part the material was polycrystalline with grey colour where as in the outside part small yellow crystallites were formed.

X-ray analysis showed no indication of any other phase besides that of pure BaCaO<sub>3</sub> phase but, probably in various parts of material (grey and yellow), the exact crystal structure changes a little due to different deformation from cubic pe-

rovskite structure. Probably it is the reason why X-ray data given in the literature are not fully consistent.

X-ray energy dissipative spectrum confirms that the stoichiometry of material is rather conserved within a large experimental error (due to the partial overlap of Ba and Ce spectra).

Enclosed color photos and electron microscope images illustrate visually irregularities in crystal formation of this compound.



**8th CIMTEC-WORLD CERAMICS CONGRESS AND FORUM  
OF NEW MATERIALS, Florence, Italy, 29/06-04/07.1994**

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**DETERMINATION OF R-CURVE IN ALUMINA BASED  
CERAMICS BY INDENTATION TECHNIQUE**

Studies using controlled indentation flaws in alumina and alumina-zirconia ceramics are presented. The ceramics disks were indented at their face centers with Vickers pyramid and then biaxial strength tests were made using a flat circular punch on a three-point support. The strength data were used to determine the R-curves (T-curves) for the ceramics.

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**EXPERIMENTAL STUDIES OF DIFFUSION AND  
THERMODIFFUSION OF SILVER AND CHROMIUM INTO  $Al_2O_3$**

The basic relations of mathematical models of thermodiffusion in solid state materials are presented. Also it contains solution of a particular case of thermodiffusion from a negligibly thin constant source into semi-infinite matrix. The experimental set for thermodiffusion in the case of constant temperature gradient is described  $\gamma = \Delta T / \Delta x = \text{const}$ . The original procedure for determination of thermodiffusion coefficient  $D_T$  on the basis of concentration curves is elaborated.

Investigation results of diffusion and thermodiffusion processes conducted at several temperatures enabled to formulate the temperature dependencies of diffusion and thermodiffusion coefficients of Ag and Cr atoms into  $Al_2O_3$ . Interpretation of temperature gradient in diffusive migration of mass and thermodiffusion coefficient in description of the effect is proposed.

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### **INDENTATION CRACKING OF CERAMICS SURFACE SUBJECTED TO ATMOSPHERES H<sub>2</sub>O, CO<sub>2</sub> AND NH<sub>3</sub> AT HIGH TEMPERATURES**

Polished rectangular bars of pure alumina and zirconia toughened alumina ceramics dimension of 5×5×50 mm were subjected to hot atmospheres of water vapour, carbon dioxide and ammonia at a temperature of 1373 K and periods of time up to 42 hours. After exposure Vickers indentations at 100 N load was applied and the produced cracks were measured. Toughness of ceramics was determined based on an approximation proposed by Anstis et al. For each atmosphere indentation cracks were measured as a function of the time of exposure.

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**INFLUENCE OF MICROSTRUCTURE OF TRANSITION LAYER  
ON MECHANICAL PROPERTIES OF JOINT: ALUMINA  
CERAMICS-ACTIVE SOLDER-FeNi42 ALLOY**

Application tests carried out on alumina ceramics-active solder-FeNi42 alloys joints have shown that high mechanical strength is not necessarily accompanied by sufficient vacuum tightness. Reasons for this are changes within ceramics microstructure i.e.presence of metallic residue of brazing components (Fe, Ni, Ti) and associated microcracking of ceramics. In order to reduce the nucleation of microcracking the surface of ceramics was modified by the application of a thin layer of nickel or copper. This modification positively affected the microstructure of the transition layer, resulting in the disappearance of microcracks and generally improved majority of functional parameters of joint i.e. vacuum tightness and thermal shock resistance.

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### **MANUFACTURE OF CARBON FIBRE-COPPER COMPOSITE BY TAPE CASTING: PROPERTIES AND APPLICATIONS**

The paper discusses the mechanical properties and the microstructure of alumina-copper and steel-copper joints bonded with an intermediary expansion interlayer made of copper-carbon fibre composite. The joints were produced using the "direct bonding" technique.

The interlayers composed of copper-35 vol.% carbon fibre were prepared by tape casting. The mechanical strength was examined in joints with two types of interlayer:

- with the carbon fibres running in parallel to the direction of the shear force, and
- with the carbon fibres running perpendicularly to the direction of the shear force.

It has been found that the highest shear strength (about 110 MPa) is obtained with the ceramic-copper joints in which the interlayer-carbon fibres run in parallel to the direction of the shear force. The shear strength of these joints is twice the strength shown by the joints without the interlayers.

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**EFFECT OF OXYGEN VACANCY CONCENTRATION ON  
METASTABILITY OF ZIRCONIA PHASES DISPERSED IN  
ALUMINA MATRIX**

The influence of oxygen content in sintering atmosphere on zirconia phases present in alumina-zirconia ceramics, was studied. It was demonstrated that in the case of ceramics sintered in atmosphere with oxygen partial pressure between  $2.80 \times 10^{-5}$  Pa and  $2.80 \times 10^{-2}$  Pa, 100% of zirconia is found in the cubic form. Appearance of transformable cubic zirconia is a result of significant oxygen vacancy concentration in zirconia grains. An increase of oxygen partial pressure in sintering atmosphere and decrease of oxygen vacancy concentration in zirconia grains lead to a breakdown of cubic phase and transformation to tetragonal and monoclinic phases. Critical values of oxygen vacancy concentration responsible for metastability of cubic and tetragonal zirconia were estimated.

**8th CIMTEC-WORLD CERAMICS CONGRESS AND FORUM  
OF NEW MATERIALS, Florence, Italy, 29/06-04/07.1994**

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**THE INTERFACE BETWEEN CARBON FIBRE-COPPER  
COMPOSITES AS A RESULT OF VARIABLE CONDITIONS  
OF BONDING**

Copper matrix composites have been widely used when very high thermal and electrical conductivity are required in conjunction with high strength and thermal resistance over wide ranges of temperature. Typical applications might be in aerospace components where high strength or stiffness is required together with the ability to withstand high thermal loading. Both the physical and mechanical properties of this type of composite are strongly influenced by the properties of the individual constituents of the composite, and also by the microstructure and properties of the products in the reaction zone at the fibre - matrix interface.

This paper presents the effect of variable conditions such as temperature, time and composition of metal matrix on forming of interface in carbon fibre - copper composite.

The conditions used for bonding were in the temperature range of 900 - 1000 °C, time of 15 - 90 minutes at constant pressure (27 MPa) and vacuum ( $2 \times 10^{-6}$  Torr). The matrix materials used in this study included pure copper powder and copper powder with Cr and Zr additions.

This paper also presents results of microstructure investigation of composites and the results of X-ray diffraction pattern, SEM micrograph and surface distribution of elements in the interface.

## **ICEC'94 - The 17th INTERNATIONAL CONFERENCE ON ELECTRICAL CONTACTS, Nagoya, Japan, 04-09/07.1994**

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### **EROSION MECHANISM OF W-Ag CONTACT MATERIAL IN THE AIR-BLAST CIRCUIT BREAKER UNDER THE SHORT-CIRCUIT CONDITIONS**

The paper discusses the erosion phenomena that occur in the W-Ag contact material applied in a Compact type low voltage air-blast circuit breaker (rated a.c. parameters: 30A, 500V, 50HZ).

The breaking capability was tested under the conditions that simulated the short-circuit action of the breaker. In the test cycle, a short-circuit current of 19kA peak ( $\cos \phi=0.3$ ) was interrupted. After 3 min, it was turned on and then interrupted again.

After the short-circuit test, changes in the contact surface and the structure of the contact material were examined.

Based on the discussion of the results obtained and on an analysis of the physico-chemical processes involved, the paper discusses, in metallurgical terms, the possible mechanism of erosion that occur in the W-Ag contact material under the short-circuit conditions.

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## **ICEC'94 - The 17th INTERNATIONAL CONFERENCE ON ELECTRICAL CONTACTS, Nagoya, Japan, 04-09/07.1994**

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### **ON THE FORMATION OF INTERPHASE BOUNDARIES OF DIFFUSION TYPE AS A METHOD OF IMPROVING INTERFACIAL ADHESION IN Ag-Ni COMPOSITE CONTACT MATERIAL**

The Ag-Ni fibre composite is widely used for contact materials in the electrical industry. The major difficulty in the fabrication of composite materials is associated with the formation of a good performance joint between the phase components. The unique advantages of composites depend critically upon the quality of the interfacial joints.

The Ag-Ni composite material consists of two metals which form a virtually immiscible system and no compound or transition layer is formed at the Ag-Ni interfaces. In order to ensure good interfacial adhesion, in the conventional technology of the Ag-Ni materials involving powder metallurgy and plastic deformation, usually complicated processes, such as cold or hot extrusion preceded by a special preparation of the batch are required.

The paper proposes a method of forming good quality interfacial Ag-Ni joints by activating the diffusion processes in the interfacial region. To improve adhesion between silver and nickel, a thin copper film is introduced at the Ag-Ni interface in a controlled manner. Copper is mutually soluble with both silver and nickel. From the distribution of the elements at the interface (examined by EDX, WDX, SIMS in combination with RBS) we have found that, if such a thin copper film is introduced into the interfacial region in a proper way, a diffusion interlayer forms there.

As shown by electrical tests performed on finished contacts, the material manufactured using the method proposed in the present paper has very good performance parameters.

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**INTERNATIONAL SYMPOSIUM OF OPTICS, IMAGING AND INSTRUMENTATION (POLARIZATION ANALYSIS AND MEASUREMENT II), San Diego, California, USA, 24-29/07.1994**

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**INVESTIGATION OF STRESS-INDUCED BIREFRINGENCE IN LARGE SEMICONDUCTOR WAFERS BY IMAGING POLARIMETRY**

An imaging polarimeter has been constructed working on a novel principle. A wafer of large area (up to 6 inches in dia.) is placed between two polarizers, whose axes make an angle of 45 deg. and are simultaneously rotated by a step engine versus against a fixed wafer. A modulated light output is analysed in every pixel of a CCD matrix of a TV-camera, and a suitable computer program enables calculation of birefringence and principal azimuths' maps (principal stress directions in isotropic materials) and also the transmittance map of the sample. A set of interference filters placed on a revolver-rotary mount enable measurements to be carried out in the whole spectral range of the camera system. The measurement technique has been applied for studying of residual stresses in semiconductors grown by the Czochralski method. These studies are particularly important in large diameter crystals where residual stresses resulting from the growth conditions and also from the mechanical treatment (grinding, cutting, lapping etc.) can be in some circumstances considerable.

Measuring of birefringence in anisotropic materials in most cases is limited to relatively thin (approx. 0.5 mm) samples due to uncertainty of its determination by the polarimetric methods. A technique of applying an interference filter of a suitable wavelength has been proposed to reduce this uncertainty. Nevertheless, in general, an operator must decide the magnitude of birefringence prior to mapping.

Several examples of the measured maps (Si, GaAs, InP and also  $\text{LiNbO}_3$ ) are presented.

The constructed polarimeter can also work as a normal polarizing microscope, since the polarizers can be set either parallel or crossed and thus isochromic or isoclinic and isochromic lines can be detected respectively.

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## ICM'94 - INTERNATIONAL CONFERENCE ON MAGNETISM Warszawa, Poland, 22-26/08.1994

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### MÖSSBAUER STUDIES OF $\text{Fe}_{73.5}\text{Cu}_1\text{Nb}_3\text{Si}_{13.5}\text{B}_9$ WITH APPLIED MAGNETIC RADIO FREQUENCY FIELDS

Nanocrystalline and microcrystalline  $\text{Fe}_{73.5}\text{Cu}_1\text{Nb}_3\text{Si}_{13.5}\text{B}_9$  samples were produced by annealing amorphous ribbons in a temperature rang from 350°C to 750°C. After measuring the samples by transmission Mossbauer spectroscopy the samples were exposed to a magnetic radio frequency field 20 Oe at 68 MHz while collecting the spectra. While the shape of the spectra recorded without radio frequency show the expected changes versus annealing temperature, we get additional information by using magnetic radio frequency fields. Due to the rf sideband effect we see the change of the magnetostriction of the samples related to different annealing temperatures. The sample annealed at 550°C for 1 hour is in the nanocrystalline state revealing very soft magnetic properties. We measured for this sample, a decrease of the magnetostriction to about 5% of the 100% value characteristic for the amorphous sample. The doublet is a consequence of the collapse of the magnetically split spectra and its shape changes significantly depending on the crystalline stages. Simultaneously we derive information about the local magnetic anisotropy. The existance of Fe-B-phases in the microcrystalline range (annealed above 625°C) suppresses the rf collapse effect.

Materiał prezentowano na sesji posterów.

Pełny tekst zaprezentowany będzie w "Journal of Magnetism  
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## ICM'94 - INTERNATIONAL CONFERENCE ON MAGNETISM Warszawa, Poland, 22-26/08.1994

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### MÖSSBAUER STUDY OF THE RADIO-FREQUENCY INDUCED EFFECTS IN AMORPHOUS AND NANOCRYSTALLINE FeZrBCu ALLOYS

The radio-frequency (rf) collapse of the magnetic hyperfine structure (hfs) in the Mössbauer spectra of soft ferromagnetic materials exposed to the rf field of 20 Oe at 60 MHz is employed to study the structure of  $\text{Fe}_{93-x-y}\text{Zr}_7\text{B}_x\text{Cu}_y$  ( $x=6, 8, 12; y=0, 2$ ) alloys in the amorphous and nanocrystalline states. The rf sidebands effect, induced by the rf field in magnetostrictive materials, allows to follow the changes of magnetostriction due to the formation of the nanocrystalline phases which are formed as a result of annealing of the amorphous alloys at 500-600°C. The rf collapse and sideband effects depend strongly on the thermal treatment in the range of 400-800°C and the alloy composition. The results show that the complete rf collapse of the magnetic hfs to the quadrupole doublet occurs only in the amorphous phase. Samples with dominating nanocrystalline phases reveal spectral components consisting of the broadened collapsed single line (related to the cubic nanocrystalline phases) and partly or marginally collapsed magnetic hfs (related to the phases with larger magnetic anisotropy). The unique rf Mössbauer technique allows the study of the microstructure and magnetic properties (anisotropy, magnetostriction) of nanocrystalline phases formed in FeZrBCu alloys and distinguish them from the amorphous and microcrystalline ones.

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**ICM'94 - INTERNATIONAL CONFERENCE ON MAGNETISM**  
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**MÖSSBAUER STUDY OF THE SHORT RANGE ORDER IN  
AMORPHOUS  $\text{Fe}_{80-x}\text{La}_x\text{B}_{20}$  ALLOYS**

Radio-frequency rf collapse of the magnetic hyperfine structure (hfs) of amorphous metals is employed to study directly, by Mössbauer spectroscopy, the quadrupole splitting in the ferromagnetic state and to obtain information about short range order. The structural changes are studied via quadrupole splitting distributions derived from the rf collapsed spectra of amorphous  $\text{Fe}_{80-x}\text{La}_x\text{B}_{20}$  when iron atoms are replaced by La atoms. Mössbauer measurements were performed with the rf field of 20 Oe at 60 MHz applied to the amorphous samples. It was found that substitution of iron by the much larger La atoms induces considerable changes of short range order. At a low concentration of La atoms ( $x < 4$ ) considerable distortion of the nearest environment of La atoms takes place leaving the basic  $\text{Fe}_{80}\text{B}_{20}$ -like structure almost unaffected. A larger La content ( $x \geq 4$ ) induces a collective change in the structure. The measurements performed during the rf exposure as a function of the exposure time revealed a structural relaxation occurring during the rf exposure. The rf Mössbauer experiments were supplemented by investigations of the magnetic properties (saturation magnetization, Curie temperatures) of the amorphous samples.

Materiał prezentowano na sesji posterów.

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and Magnetic Materials".

**ICM'94 - INTERNATIONAL CONFERENCE ON MAGNETISM**  
**Warszawa, Poland, 22-26/08.1994**

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**INTERFACE STRUCTURE, MAGNETIC AND ELECTRICAL  
PROPERTIES OF Fe/Gd MULTILAYERS**

Fe/Gd multilayers of the thickness ratio  $d_{\text{Fe}}/d_{\text{Gd}}=1$  ( $\text{Fe}_{0.75}\text{Gd}_{0.26}$ ) and 0.35 ( $\text{Fe}_{0.5}\text{Gd}_{0.5}$ ) with wavelength modulation varied in the range  $1.7\text{nm} \leq l \leq 80\text{nm}$ , were sequentially deposited by rf sputtering from Fe and Gd targets. The growth of amorphous phase in as-deposited samples was controlled by CEMS, XRD and resistivity. CEMS measurements identified crystalline bcc-Fe, amorphous Fe-Gd and amorphous-Fe (only for  $d_{\text{Fe}}/d_{\text{Gd}}=0.35$ ) phases according to [1]. Magnetoresistivity and magnetic hysteresis loop show the change from antiparallel alignment of Gd and Fe spin at low magnetic field to the twisted state when H becomes large enough to break antiparallel coupling.

[1] J.Landes, Ch.Sauer, B.Kabius and W.Zinn, Phys. Rev. B44 (1991) 8342

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Materiał zaprezentowano na sesji posterów.

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**ICM'94 - INTERNATIONAL CONFERENCE ON MAGNETISM  
Warszawa, Poland, 22-26/08.1994**

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**ION-BEAM MIXING FE/ZR MULTILAYERS**

Structure and magnetization was studied in Fe/Zr multilayers prepared by rf sputtering with thickness ratio  $d_{\text{Fe}}/d_{\text{Zr}}=0.5$  ( $\text{Fe}_{0.50}\text{Zr}_{0.50}$ ) and 1 ( $\text{Fe}_{0.66}\text{Zr}_{0.34}$ ) and wavelength modulation ranging from 0.9 to 80 nm. The as-deposited samples with  $d_{\text{Fe}} > 10$  nm were crystalline and those with  $d_{\text{Fe}} \leq 10$  nm exhibited an amorphous component which increased with a decrease in thickness. Multilayers become fully amorphous when Fe sublayers achieve  $d_{\text{Fe}} < 1.7$  nm. The samples were irradiated with 150 keV Ar ions to a dose of  $1.5 \cdot 10^{16}$  Ar/cm<sup>2</sup>. CEMS, XRD and saturation magnetization measurements allowed quantitative analysis of the amorphization process.

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Materiał zaprezentowano na sesji posterów.  
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## **KRONIKA ITME**

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### **W KONKURSIE MISTRZ TECHNIKI Warszawa 1994.**

Przyznano wyróżnienie Rady Stołecznej Naczelnej Organizacji Technicznej zespołowi pracowników ITME w składzie:

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mgr Bogumiła NIEWCZAS, mgr Judyta HECHNER, inż. Tadeusz WRÓBEL  
za

### **FILTRY Z AKUSTYCZNĄ FALĄ POWIERZCHNIOWĄ (TYPY FT-389 I FTQ-385) DLA ZASTOSOWAŃ W ODBIORNIKACH TELEWIZYJNYCH**

## **INFORMACJA O WAŻNIEJSZYCH KONFERENCJACH, SEMINARIACH, TARGACH, WYSTAWACH - 1995 r. <sup>1</sup>**

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19th Annual Cocoa Beach Conference and Exposition on Composites,  
Advanced Ceramics, Materials and Structures.

01-08/12. Cocoa Beach, FL, USA

Seventh Annual IEEE International Conference on Wafer-Scale Integration.  
The Conference on Large Area Devices, System on a Substrate and Complex McMs.

01-18/20. San Francisco, CA, USA

IEEE Multi-Chip Module Conference.

01/31/-02/02. Santa Cruz, CA, USA

IBMM'95 - Ninth International Conference on Ion Beam Modification of  
Materials.

02-05/10. Canberra, Australia

Annual Meeting of the Metallurgical Society.

02-12/16. Las Vegas, NE, USA

ISSCC'95-IEEE International Solid State Circuits Conference.

02-15/17. San Francisco, CA, USA

SPIE's 1995 Symposium on Microlithography .

02-19/24. Santa Clara, CA, USA

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<sup>1</sup> Szczegółowe dane dotyczące organizatora i programu znajdują się w Ośrodku Informacji  
Naukowej i Technicznej (DS-3) ITME, tel. 35-30-41 wew.108

MTT-S International Topical Symposium on Technologies for Wireless Application.

02-21/23. Vancouver, Canada

Euro MBE VIII/Eighth European MBE Workshop.

03. Spain

EDAC/ETC/EUROASIC - The 1995 European Design and Test Conference.

03-06/09. Paris, France

Third International Workshop on the Measurement and Characterization of Ultra-Shallow Doping Profiles in Semiconductors.

03-20/22. Research Triangle Park, NC, USA

ICMTS'95/IEEE International Conference on Microelectronic Test Structures.

03-23/25. Nara, Japan

IRPS'95/International Reliability Physics Symposium.

04-03/06. Las Vegas, NE, USA

II Krajowe Sympozjum: Technika Jądrowa w Przemysle, Medycynie, Rolnictwie i Ochronie Srodowiska.

04-24/28. Warszawa

ISCAS'95/IEEE International Symposium on Circuits and Systems.

04/29-05/03. Seattle, WA, USA

The European Design Conference.

05-06/-09. Paris, Fr.

LDSD'95 /First International Conference on Low Dimensional Structures and Devices.

05-08/10. Singapore

IPRM - Seventh IEEE International Conference on Indium Phosphide and Related Materials.

05-09/13. Hokkaido, Japan

ISHM Nordic 10th European Microelectronics Conference and Exhibition.

05-14/17. Copenhagen, Denmark

IEEE Microwave and Millimeter-Wave Monolithic Circuits Symposium.

05-15/16. Orlando, FL, USA

IEEE/MIT-S International Microwave Symposium.

05-15/19. Orlando, FL, USA

4th International Conference "Advances in the Fusion and Processing of Glass".

05-21/24. Würzburg, Germ.

3rd Conference of the European Society of Glass Science and Technology.

05-21/24. Würzburg, Germ.

69th Annual Meeting of the German Society of Glass Technology.

05-21/24. Würzburg, Germ.

187th Spring Meeting of the Electrochemical Society: symposia.

05-21/26. Reno, NE, USA

ECTC'95/IEEE 45th Electric Components and Technology Conference.

05-22/24. Las Vegas, NE, USA

6th Spring School on Acousto-Optics and its Applications.

05-22/26. Gdańsk

ICM-7/7th International Conference on Mechanical Behaviour of Materials.

05/28-06/02. Hague, Netherlands

Optical Velocimetry Symposium.

05/29-06/02. Warszawa

ICNF'95/13th International Conference on Noise in Physical Systems and 1/f Fluctuations.

05/29-06/02. Palanga, Lithuania

MIOP'95 - Microwave and Optoelectronics Conference and Exhibition on High Frequency Engineering.

05/30-06/01. Sindelfingen, Germ.

International Symposium on VLSI Technology Systems and Applications.

05/31-06/02. Taipei, Taiwan

International Conference on Mechanics of Solids and Materials Engineering.

06-05/07. Singapore

THERMAL STRESSES'95-1st International Symposium on Thermal Stresses and Related Topics.

06-05/07. Shizuoka University, Hamamatsu, Japan

VLSI Technology - VLSI Circuits Symposium.

06-06/08. Kyoto, Japan

MATEL '95 - Konferencja nt. Nowe Materiały i Technologie w Elektrotechnice.

06-07/09. Łódź

ISSCG IX/9th International Summer School on Crystal Growth.

06-11/16. Arnheim, Netherlands

ICCG XI/11th International Conference on Crystal Growth.

06-18/23. Hague, Netherlands

EWMOVPE VI - 6th European Workshop on MOVPE.

06-25/28. Gent, Belgium

ICCBE-V/The Fifth International Conference on Chemical Beam Epitaxy and Related Growth Techniques.

08-13/16. San Diego, CA, USA

HT-CMC-2 - Second International Conference on High Temperature Ceramic Matrix Composites.

08-21/24. Santa Barbara, CA, USA

XXIX Colloquium Spectroscopium/Internationale Spectroscopy Conference.

08/27-09/01. Leipzig, Germ.

V Polska Konferencja Chemii Analitycznej: Analityka w Służbie Człowieka i środowiska.

09-03/09. Gdańsk

EMMA'95 - European Magnetic Materials and Applications Conference.

09-04/08. Wien, Austria

SISDEP'95 - 6th International Conference on Simulation of Semiconductor Devices and Processes.

09-06/08. Erlangen, Germ.

EUROMAT'95/4th European Conference on Advanced Materials and Processes.

09-25/28. Venice/Padua, Italy

International Conference on Ligth-Weight Structures in Civil Engineering.

09-25/29. Warszawa

XVII International Congress on Glass.

10. Beijing, China

188th Meeting of the Electrochemical Society: symposia.

10-08/13. Chicago, IL, USA

8th World Conference on Titanium.

10-22/26. Birmingham. UK