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Division of metal systems

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CURRICULUM, EDUCATION

- 1970-75: Student, UPJS Kosice, Fakulty of Science, department of experimental physic
- 1975-76: University of Pavol Jozef Šafarik, Košice, Physic Department – lecture assistant.
- 1977-83: Institute of Materials Research, Košice, Post graduate course.
- 1983: Technical University Košice, PhD in Material Sciences.
- 1983-96: IMR SAS Košice, scientific worker
- 1988-1991: external scientific consultant of STRATCOR company, USA
- 1996-up to now: senior scientific worker

LINGUISTIC SKILLS

Slovak, English, German, Russian

SCIENTIFIC ACTIVITIES

- theory of microstructure development during thermo and thermo-mechanical treatments of steel, mechanism of grain boundary motion, thermo and strain induced grain growth and its kinetic
- interaction of grain boundaries with secondary phase particles, phases and solute elements
- recovery processes, dynamic and static recovery, recrystallization during hot-rolling and after cold-rolling treatments, selective grain growth, development of crystallographic texture.
- plastometric simulation of thermo-mechanical processes, analyzes of strain-deformation relationships from substructural changes point of view
- development of microstructural and textural multilayered steels
- materials area: low carbon, construction, deep-drawing, electrotechnical, multifunctional and AHSS steels.

TEACHING ACTIVITIES

- 1986 – 88: Technical University Košice, lecture assistant. (steel testing)
- 1997 – up to now: Supervisor for PhD courses in specialization 39-03-9 “Materials engineering and critical state of materials”.
- Referee of solid states physic subject for PhD courses in specialization “Materials engineering and critical state of materials” at IMR SAS.

- Referee of solid states physic subject for PhD courses in specialization "Physical metallurgy" at TU Kosice.
- Committee-man of scientific PhD examining board in specialization 5.2.41 „Physical Metallurgy" at Faculty of Metallurgy, TU Kosice.

PROJECTS (COORDINATOR)

1) ITMS-26220220064: „Research Centrum for Combinated and Renewable Resources of Energy", 2010 – 2014.
2) ITMS-26220220037: "Technology of preparation of electrotechnical steels possessing high permeability for high affectivity electromotors", 2010 – 2 012.
3) APVV 0147-11: „High-strength electrotechnical composite steels", 2012 – 2015
4) VEGA 2/0081/16: „Modification of surface microstructure of tool steels by laser", 2016 – 2018.
5) APVV 15-0259: „Unconventional technology development of final processing of isotropic electrical steels", 2016 – 2019.

List of publications:

Author ID (in SCOPUS database): **55570311100**

1) I. Petryshynets, **F. Kováč**, J. Marcin, I. Škorvánek: Magnetic properties of temper rolled NO FeSi steels with enhanced rotation texture. IEEE Transactions on Magnetics, 49, 2013, p.4303-4306.
2) I. Petryshynets, **F. Kováč**, J. Marcin, I. Škorvánek: Improved processing technique for preparation of non-oriented electrical steels with low coercivity. Acta Physica Polonica A, 126, 2014, p.182-183.
3) I. Petryshynets, **F. Kováč**, M. Sopko, J. Marcin, B. Petrov: Study of microstructure and texture evolution in grain-oriented steels via coercivity measurements. IEEE Transactions on Magnetics, 50, 2014, p.1-4.
4) I. Petryshynets, **F. Kováč**, V. Puchý, M.Šebek, J. Füzer and P. Kollár: Magnetic losses reduction in grain oriented silicon steel by pulse and continuous fiber laser processing. In. AIP Advances 8, 2018, 047604.
5) I. Petryshynets, **F. Kováč**, L. Falat, V. Puchý and M. Šebek: Magnetic losses evolution of ferritic Fe-Si Steel Subjected to Temper Rolling at Elevated Temperature. In Acta Physica Polonica A, 2018, vol. 133, no. 4, p. 1065-1068.

Active patent applications and patents:

1) **F. Kováč**, I. Petryshynets: High strength isotropic electrotechnical steel with composite microstructure. Patent applications N: PP 00090-2015. Banská Bystrica : ÚPV SR 2015
2) **F. Kováč**, I. Petryshynets: Method for the preparation of high-strength electrotechnical steel with composite microstructure. Patent applications N: PP 110-2015. ÚPV SR 2016
3) **F. Kováč**, I. Petryshynets, V. Stoyka, T. Kvačkaj, I. Škorvánek: Method for the production of low-watt isotropic electrotechnical steels. Patent N: 288322. Banská Bystrica : ÚPV SR 2015
4) **F. Kováč**, I. Petryshynets: Zirnovo-oriented electrotechnical steel, microalloyed with vanadium, and method of its production. Patent N: 288414. Banská Bystrica : ÚPV SR 2016

Collaboration with industry

- Supervisor for circa 45 projects within collaboration with USS Košice, Vítkovice, ZŤS Zvolen, Škoda Plzeň, Embraco Slovakia. The projects were aimed on the development of new materials and new production technology

STAYS ABROAD

- 1979: CNIICHERMET Moscow, training course "Analysis of recrystallization processes in steels".
- 1983-1993: ZFW Dresden, 9 training courses /4-6 weeks/ "Plastometric simulation of deformation processes".
- 1991: IMR Stockholm, "Investigation of deformation induced grain growth in structural steels".
- 1995: VŠB Ostrava, "Analysis of microstructure development during hot rolling".
- 1990-1993: VÚ Vítkovice, 3 training courses "Model real rolling processes by torsion plasrometer".
- 2006 – Institute of Materials, Shanghai University, China, development of cubic texture, /1 month/

MEMBERSHIPS, AWARDS

- 1986 : „Award of Czechoslovak and German Academy of Sciences".
- Member of Croatian Society for Materials and Tribology
- Member of Scientists Council in IMR SAS.
- Scientific results „Steels with gradient microstructure." were awarded as one of the three best works at SAS in are of technical sciences in 2005.
- Committee-man of VEGA #.5
- Member of editorial board for "Metallic Materials"

NUMBER OF PUBLICATIONS: 180, there from 83 journal articles,
9 patents.

NUMBER OF CITATIONS: *338*

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