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Group of Physics of Materials (GPM)
University and INSA of Rouen
CNRS Join Research Team 6634
Labex EMC3 / Equipex-APE Genesis /
Carnot Institute ESP / EDF-CNRS join
laboratory EM²VM

Education

- 2001-2004** PhD at University of Rouen in the Group of Physics of Materials: "*Study of the formation of solute clusters under irradiation in ferritic model alloys*", PhD directors: Pr. P. Pareige and Dr. A. Barbu.
- 2000-2001** Master Degree in Material Science at University of Rouen with 5 months research training at Group of Physics of Materials: "*Study of the microstructural evolution of VVER 440 pressure vessel steel by Atom Probe Tomography*"

Teaching experience

- since 2005:** Lecturer at University of Rouen: Lectures and practical of *Optic, Physic* to undergraduate students, Lecture of *Material Sciences* to undergraduate and postgraduate students, Lecture of *Materials under irradiation* in Engineer School, Responsible of the 1st year of the Master "
- 2001-2004:** Teaching assistant at University of Rouen

Research Experience

- Since 2005:** Research activities in the Group of Physics of Materials
Keywords: *Material Sciences, Nuclear materials, Phase transformation, Irradiation ageing, Steels, Atom Probe Tomography, Dual-beam, Cluster Dynamic modeling*
- 2005:** Post-doctoral position at Hahn-Meitner-Institute (Berlin, Germany)
"*First stages of crystallisation of amorphous aluminium alloys*"

Current project participations and collaborations

- Labex EMC3 project NANINOX (2013-2014)**
Influence of nanostructuration on the microstructural and properties evolution under irradiation of stainless steels
- French project CPR ODISSEE (2011-2014)**
"Oxide Dispersion Strengthened StEELs"
- European Project LONGLIFE (2010-2013)**
"Treatment of long term irradiation embrittlement effects in RPV safety assessment"
- European Project PERFORM60 (2009-2013)**
"Prediction of the effects of radiation for reactor in-core materials"
- EFDA (since 2008)**
"European fusion Development Agreement - Fusion Materials - Nano-structured ODS ferritic steels development"

Publications

Radiation-induced solute precipitation in a ferritic alloy: an experimental and theoretical study

E. Meslin, B. Radiguet and M. Loyer

Acta Materialia 61 (2013) 6246-6254

Influence of ball-milling and annealing conditions on nanoclusters characteristics in oxide dispersion strengthened steels

M. Laurent-Brocq, F. Legendre, M.-H. Mathon, A. Mascaro, S. Poissonnet, B. Radiguet, M. Loyer, O. Leseigneur.

Acta Materialia 60 (2012) 7150-7159

Irradiation-Induced Solute Clustering in a Low Nickel FeMnNi Ferritic Alloy

E. Meslin, B. Radiguet, P. Pareige, C. Toffolon, A. Barbu

Experimental mechanics 51 (2011) 1453-1458

Effect of Mn on the Nanoprecipitation in Binary Fe-Cu alloys

R. Shabadi, R. Taillard, B. Radiguet, J. de Baerdemaeker, E. Leunis

Solid State Phenomena 172-174 (2011) 297-302

Comparison of radiation-induced segregation in ultrafine-grained and conventionnal 316 austenitic stainless steels

A. Etienne, B. Radiguet, N.J. Cunningham, G.R. Odette, R. Valiev, P. Pareige

Ultramicroscopy 111 (2011) 659-663

Review on the EFDA Work Programme on Nano-Structured ODS RAF Steels

N. Baluc, J.L. Boutard, S.L. Dudarev, M. Rieth, J. Brito Coreia, B. Fournier, J. Henry, F. Legendre, T. Leguey, M. Lewandowska, R. Lindau, E. Marquis, A. Munoz, B. Radiguet, Z. Oksiuta

Journal of Nuclear Materials 417 (2011) 149-153

Nanoscale characterization and formation mechanism of nanoclusters in an ODS steel elaborated by reactive-inspired ball-milling and annealing

M. Brocq, B. Radiguet, S. Poissonnet, F. Cuvilly, P. Pareige, F. Legendre

Journal of Nuclear Materials 409 (2011) 80-85

Characterization of neutron-irradiated ferritic model alloys and RPV steel from combined APT, SANS, TEM and PAS analyses

E. Meslin, M. Hernandez-Mayoral, F. Bergner, M. Lambrecht, A. Almazouzi, P. Pareige, B. Radiguet, A. Barbu, D. Gomez-Briceno, A. Ulbricht

Journal of Nuclear Materials 406 (2010) 73-83

On the correlation between irradiation-induced microstructural features and the hardening of reactor pressure vessel steels

M. Lambrecht, E. Meslin, L. Malerba, M. Hernandez-Mayoral, F. Bergner, P. Pareige, B. Radiguet, A. Almazouzi

Journal of Nuclear Materials 406 (2010) 84-89

Atomic scale investigation of radiation-induced segregation in austenitic stainless steels

A. Etienne, B. Radiguet, N.J. Cunningham, G.R. Odette, P. Pareige

Journal of Nuclear Materials 406 (2010) 244-250

Understanding silicon-rich phase precipitation under irradiation in austenitic stainless steels

A. Etienne, B. Radiguet, P. Pareige

Journal of Nuclear Materials 406 (2010) 251-256

Thermal stability of ultrafine-grained austenitic stainless steels

A. Etienne, B. Radiguet, C. Genevois, J.-M. Le Breton, R. Valiev, P. Pareige
Materials Science and Engineering A 527 (2010) 5805-5810

Dislocation loop evolution under ion irradiation in austenitic stainless steels

A. Etienne, M. Hernandez-Mayoral, C. Genevois, B. Radiguet, P. Pareige
Journal of Nuclear Materials 400 (2010) 56-63

Kinetics of solute clustering in neutron irradiated ferritic model alloys and a French pressure vessel steel investigated by atom probe tomography

E. Meslin, B. Radiguet, P. Pareige, A. Barbu
Journal of Nuclear Materials 399 (2010) 137-145

Nanoscale characterisation and clustering mechanism in an Fe-Y2O3 model ODS alloy processed by reactive ball milling and annealing

M. Brocq, B. Radiguet, J.-M. Le Breton, F. Cuvilly, P. Pareige, F. Legendre
Acta Materialia 58 (2010) 1806-1814

Revision of the irradiation embrittlement correlation used for the EDF RPV fleet

P. Todeschini, B Radiguet, H. Huang, P. Pareige, Y. Lefebvre, G. Chas, H. Churier-Bosseneq, C. Benhamou

Proceeding Technical meeting IAEA 2010, Znojmo – Tcheq Republic

Study of irradiation effects in austenitic stainless steels

A. Etienne, P. Pareige, B. Radiguet, N.J. Cunningham, G.R. Odette, C. Pokor
Proceeding Fontevraud 7 (2010) Avignon – France

Evolution of the microstructure of a French reactor pressure vessel steel under neutron irradiation

H.F. Huang, B. Radiguet, P. Todeschini, G. Chas, P. Pareige
Proceeding Fontevraud 7 (2010) Avignon – France

Atom Probe Tomography characterization of the microstructural evolution of a low copper reactor pressure vessel steel under neutron irradiation

H.F. Huang, B. Radiguet, P. Todeschini, G. Chas, P. Pareige
Proceeding MRS Spring meeting 2010, San Francisco - USA

Study of Nano-cluster Formation in Fe-18Cr ODS Ferritic Steel by Atom Probe Tomography

O. Kalokhtina, B. Radiguet, Y. de Carlan, P. Pareige
Proceeding MRS Spring meeting 2010, San Francisco - USA

Irradiation induced clustering in low copper or copper free ferritic model alloys

B. Radiguet, P. Pareige, A. Barbu
Nuclear Instruments & Methods in Physic Research Section B – Beam Interactions with Materials and Atoms 267 (2009) 1496-1499

Experimental atomic scale investigation of irradiation effects in CW 316SS and UFG-CW 316SS

P. Pareige, A. Etienne, B. Radiguet
Journal of Nuclear Materials 389 (2009) 259-264

Cluster-dynamics modelling of defects in alpha-iron under cascade damage conditions

E. Meslin, A Barbu, L. Boulanger, B. Radiguet, P. Pareige, K. Arakawa, C.C. Fu
Journal of Nuclear Materials 382 (2008) 190-196

Irradiation behavior of nanostructured 316 austenitic stainless steel

B. Radiguet, A. Etienne, P. Pareige, X. Sauvage, R. Valiev

Journal of Material Science 43 (2008) 7338-7343

Tomographic atom probe characterization of the microstructure of a cold worked 316 austenitic stainless steel after neutron irradiation

A. Etienne, B. Radiguet, P. Pareige, J.P. Massoud, C. Pokor

Journal of Nuclear Materials 382 (2008) 64-69

Segregation-controlled nano-crystallization in an Al-Ni-La metallic glass

B. Radiguet, D. Blavette, N. Wanderka, J. Banhart, L. Sahoo

Applied Physic Letters 92 (2008) 103126

Crystallization behavior of Al₈₇Ni₅La₇Zr₁ metallic glass

N. Wanderka, B. Radiguet, K.L. Sah, J. Banhart

Materials Science Forum 539-543 (2007) pp 1917-1920

Understanding of copper precipitation under electron or ion irradiations in FeCu_{0.1} wt% ferritic alloy by combination of experiments and modelling

B. Radiguet, A. Barbu, P. Pareige

Journal of Nuclear Materials 360 (2007) 104-117

Stability of nanometer-sized oxide clusters in mechanically-alloyed steel under ion-induced displacement cascade damage conditions

P. Pareige, M.K. Miller, R. E. Stoller, D.T. Hoelzer, E. Cadel, B. Radiguet

Journal of Nuclear Materials 360 (2007) 136-142

Heterogeneous irradiation-induced copper precipitation in ferritic iron-copper model alloys

P. Pareige, B. Radiguet, A. Barbu

Journal of Nuclear Materials 352 (2006) 75-79

Atomic-level observation with three-dimensional atom probe of the solute behaviour in neutron, ion or electron irradiated ferritic alloys

P. Pareige, B. Radiguet, R. Krummeich-Brangier, A. Barbu, O. Zabusov, M. Kozodaev

Philosophical Magazine 85, (2005) 429-441

Influence of electron irradiation on the microstructure of ferritic model alloys

B. Radiguet, P. Pareige, A. Barbu

Surface and Interface Analysis 36 (2004) 515-521

Three-dimensional atom probe study of irradiated, annealed and re-irradiated VVER 440 weld metals

P. Pareige, B. Radiguet, A. Suvorov, M. Kozodaev, E. Krasicov, O. Zabusov, J.P. Massoud

Surface and Interface Analysis 36 (2004) 581-584

Conferences and invited talks

Characterization of the microstructure of low copper RPV steels irradiated up to very high neutron dose by Atom Probe Tomography

B. Radiguet, S. Cammelli, H.F. Huang, P. Pareige

IGRDM 17, 19-24 May, Les Embiez, France

Evaluation of the presence of vacancies in irradiation induced solute clusters by combination of Atom Probe Tomography and X-Ray Absorption Spectroscopy

S. Cammelli, B. Radiguet, P. Pareige

IGRDM 17, 19-24 May, Les Embiez, France

GENESIS : An open platform for the study and nano analysis (Atom probe, SEM Cross beam station and MET (in situ straining, temperature, tomography) of irradiation effects in radioactive materials for nuclear application

P. Pareige, B. Radiguet, C. Pareige

TMS Annual Meeting, 3-7 March 2013, San Diego - USA

Atom Probe Tomography investigation of the evolution of the microstructure of ion irradiated ODS ferritic steels

B. Radiguet, C. Hatzoglou, L. Chaffron, Y. Serruys, F. Legendre, P. Pareige

TMS Annual Meeting, 3-7 March 2013, San Diego - USA

Evaluation of the presence of vacancies in irradiation induced solute clusters in ferritic model alloys by combination of Atom Probe Tomography and X Ray absorption Spectroscopy

S. Cammelli, B. Radiguet, P. Pareige, Y. Serruys

TMS Annual Meeting, 3-7 March 2013, San Diego - USA

Synergetic effect of Ni and Cu in French reactor pressure vessel steels

H.F. Huang, B. Radiguet, P. Todeschini, F. Clémendot, P. Pareige

TMS Annual Meeting, 3-7 March 2013, San Diego - USA

Understanding of the microstructural evolution of austenitic model alloy and 316 steel under ion irradiation by coupling of TEM and APT investigations – Part II: APT results

A. Volgin, B. Radiguet, P. Pareige, B. Décamps, A. Gentils, F. Fortuna, C. Pokor

TMS Annual Meeting, 3-7 March 2013, San Diego – USA

Characterisation of radiation damage by APT

B. Radiguet

Soteria (Training Symposium on Irradiation Effects in Structural Materials for Nuclear Reactors), 17-21 September 2012, Seville

Effect of Cu level on the microstructure evolution of 16MND5 steels from EDF surveillance program

H. Huang, B. Radiguet, P. Todeschini, F. Clémendot, P. Pareige

TMS Annual Meeting, 11-15 March 2012, Orlando - USA

Atom Probe Tomography study of ion irradiation effects on microstructure of ODS ferritic steels

B. Radiguet, F. Cuvilly, O. Kalokhtina, P. Pareige, M. Couvrat, L. Chaffron, Y. Serruys, F. Legendre

TMS Annual Meeting, 11-15 March 2012, Orlando – USA

Study of ion irradiation effects on microstructure of an Fe-18Cr ODS ferritic steel by Atom Probe Tomography

B. Radiguet, C. Hatzoglou, F. Cuvilly, P. Pareige, M. Couvrat, L. Chaffron, Y. Serruys, F. Legendre

20th workshop on Fe-Cr alloys and 2nd workshop on nuclear Fe alloys, 9-10 May 2012 - Rouen

Ion irradiation effects on the microstructure of steels by Atom Probe Tomography

B. Radiguet

EMIR Users days, October 20-21 2011, Orsay - France

Effect of Cu level on the microstructure evolution of 16MND5 steels from EDF surveillance program

B. Radiguet, H. Huang, P. Todeschini, F. Clémendot, P. Pareige

IGRDM 16, 4-9 December 2011, Santa Barbara - USA

Irradiation induced clustering in under-saturated Fe-Mn model alloy

B. Radiguet, E. Meslin, M. Loyer, A. Barbu, P. Pareige

IGRDM 16, 4-9 December 2011, Santa Barbara – USA

Contribution of APT to the understanding of material ageing under irradiation

B. Radiguet

3rd School on Atom Probe Tomography, Rouen, October 17-21, 2011

Ion irradiation effects on microstructure of ODS ferritic steels by Atom Probe Tomography

B. Radiguet, F. Cuvilly, C. Genevois, O. Kalokhtina, P. Pareige, M. Couvrat, L. Chaffron, Y. Serruys, F. Legendre

E-MRS Spring Meeting, 9-13 May 2011, Nice – France

Study of irradiation effects in austenitic stainless steels

A. Etienne, B. Radiguet, C. Pokor, N.J. Cunningham, G.R. Odette, P. Pareige

Fontevraud 7, 26-30 September 2010, Avignon – France

Evolution of the microstructure of a French reactor pressure vessel steel under neutron irradiation

H.F. Huang, B. Radiguet, P. Todeschini, G. Chas, P. Pareige

Fontevraud 7, 26-30 September 2010, Avignon – France

Thermal stability and irradiation behavior of ultrafine grain 316 austenitic stainless steel

A. Etienne, B. Radiguet, C. Genevois, J.M. Lebreton, X. Sauvage, R. Valiev, P. Pareige

Atomic transport in Bulk Nano Materials, 26-27 May 2010, Rouen - France

Experimental atomic scale analyses of ion irradiation effects in Ti_3SiC_2

B. Radiguet, C. Hatzoglou, F. Cuvilly, Pareige, M. Le Flem

7th International Conference on High Temperature Ceramic Matrix Composites, 20-22 September 2010, Bayreuth - Germany

Atomic scale investigation of the formation of nano-clusters in an oxide dispersion strengthened ferritic steel elaborated by ball-milling and thermo-mechanical treatments

B. Radiguet, O. Kalokhtina, M. Couvrat, L. Chaffron, P. Pareige

E-MRS Spring Meeting, 7-11 June 2010, Strasbourg - France

Irradiation-induced solute clustering in under-saturated ferritic model alloys

B. Radiguet, E. Meslin, P. Pareige, A. Barbu

MRS Spring meeting, 5-9 April 2010, San Francisco - USA

Long term annealing effect on microstructure evolution of French RPV steel

B. Radiguet, P. Todeschini, P. Pareige

International Group of Radiation Damage Mechanisms 15, 12-16 October 2009, Budapest - Hungary

Microstructural evolution of FeMn binary alloy under ion irradiation

B. Radiguet, E. Meslin, A. Barbu, P. Pareige

International Group of Radiation Damage Mechanisms 15, 12-16 October 2009, Budapest - Hungary

Irradiation induced clustering in low copper or copper free ferritic model alloys

B. Radiguet, P. Pareige, A. Barbu

16th International Conference on Ion Beam Modification of Materials, 31 August - 5 September 2008, Dresden - Germany

Formation mechanisms of solute clusters in ferritic model alloys (low copper and copper free) and in a RPV steel under neutron irradiation

E. Meslin, B. Radiguet, P. Pareige, A. Barbu
International Group of Radiation Damage Mechanisms 14, 12-20-25 April 2008, Pittsburgh, USA

Nano-structured Materials for Radiation Environment

B. Radiguet

Symposium on Functional Nanomaterials for Power Engineering, Rusnanotech 08, 3-5 December 2008, Moscow - Russia

Irradiation behavior of nanostructured 316 austenitic stainless steel

B. Radiguet, A. Etienne, P. Pareige, X. Sauvage, R. Valiev

5th International Symposium on Ultrafine-Grained Materials – 137th TMS Annual Meeting, 9-13 March 2008, New-Orleans - USA

Kinetic of formation of solute clusters in Cu or Cu free ferritic model alloys under neutron irradiation - Study by 3D Atom Probe

E. Meslin, B. Radiguet, P. Pareige, A. Barbu

Symposium on Microstructural Processes in Irradiated Materials - 136th TMS Annual Meeting, 25 February – 1st March 2007, Orlando - USA

Study of the kinetic of formation of solute clusters in Cu or Cu free ferritic model alloys under neutron irradiation: 3D Atom Probe and modeling

B. Radiguet, E. Meslin, P. Pareige, A. Barbu

International Group of Radiation Damage Mechanisms 13, 15-20 October 2006, Tsukuba – Japan

Atom Probe Tomography: Advantages and Disadvantages

B. Radiguet

International School on Experimental Quantification of Radiation Damage, 25-29 September 2006, Rochehaut - Belgium

Study of the formation of copper rich cluster under irradiation in FeCu0.1wt% ferritic alloy

B. Radiguet, P. Pareige, A. Barbu

7th International Moscow School of Physic,- 16-26 february 2004, Moscow - Russia

Influence of the chemical composition and point defects creation mode on the formation of solute clusters under irradiation in model alloys

B. Radiguet, P. Pareige and A. Barbu

International Group of Radiation Damage Mechanisms 11, 11-16 September 2003, San Diego - USA

Study of the formation of solute clusters under irradiation in model alloys

B. Radiguet, P. Pareige, A. Barbu, R. Krummeich-Brangier, S. Jumel

International Group of Radiation Damage Mechanisms 10, 19-24 May 2002, Osaka – Japan