Horizon 2020
Programme

GENIORS

Research and Innovation Action (RIA)

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http://geniors.eu/

GENIORS

Clustering Events 3

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Summary

The second GENIORS clustering event was the NFC3 online conference (Nuclear Fuel Cycle: a Chemistry Conference) replacing the ATALANTE conference which was first postpone one year and eventually cancelled due to the COVID-19 pandemic. The NFC3 conference was organized jointly by the French Alternative Energies and Atomic Energy Commission (CEA), the University of Montpellier (UM), the French National Centre for Scientific Research (CNRS) and LGI Consulting (LGI). The conference intended to provide a unique platform dedicated to discussions on the latest chemistry research progresses and breakthroughs within the nuclear fuel cycle community.

Approval

Date	By
2021-05-28 14:30:53	Dr. Thomas CARDINAELS (SCK-CEN)
2021-05-28 15:26:50	Mr. Chris RHODES (NNL)
2021-05-31 11:27:13	Mr. Stéphane BOURG (CEA)

CONTENT

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EXECUTIVE SUMMARY

The second GENIORS clustering event was the NFC3 online conference (Nuclear Fuel Cycle: a Chemistry Conference) replacing the ATALANTE conference which was first postpone one year and eventually cancelled due to the COVID-19 pandemic. The NFC3 conference was organized jointly by the French Alternative Energies and Atomic Energy Commission (CEA), the University of Montpellier (UM), the French National Centre for Scientific Research (CNRS) and LGI Consulting (LGI). The conference intended to provide a unique platform dedicated to discussions on the latest chemistry research progresses and breakthroughs within the nuclear fuel cycle community.

This first edition was held as a virtual event on May 4th and 5th 2021 and aimed to give the opportunity for young scientists to exchange and present chemistry advances related to all the aspects of the nuclear fuel cycles. Keynote lectures and contributed talks were given covering the following topics:

- Actinide and fission product chemistry
- Actinides separation
- Actinide materials: nuclear fuels and radwaste matrices
- Waste conditioning and Geological repository

At the opening of the NFC3 conference, there were more than 260 registered participants from 93 research institutes or universities and 27 countries.

SCOPE

The sixth edition of the ATALANTE conference was planned in June 2020, reported in May 2021, then finally cancelled by early 2021 due to the sanitary situation. Therefore, we decided to organize the NFC3 conference, as a virtual event, to keep the opportunity for the GENIORS project to communicate and disseminate widely around nuclear chemistry, and with a schedule close to that was initially planned for ATALANTE 2021.

In January 2021, a first announcement was sent. In February 2021, the conference web page was published on the GENIORS website. Applicants had 2 months to submit an abstract for an oral presentation, and despite this short delay, we received more than 100 abstracts covering all the aspects of the nuclear fuel cycle. The planned 2-day format constrained the committee to make difficult selection for the allocation of the 30 oral presentations. In accordance with the objectives and the training and education target of GENIORS, the priority was given to young researchers: 24 slots were given to PhD students or post-docs. Additionally, 2 young

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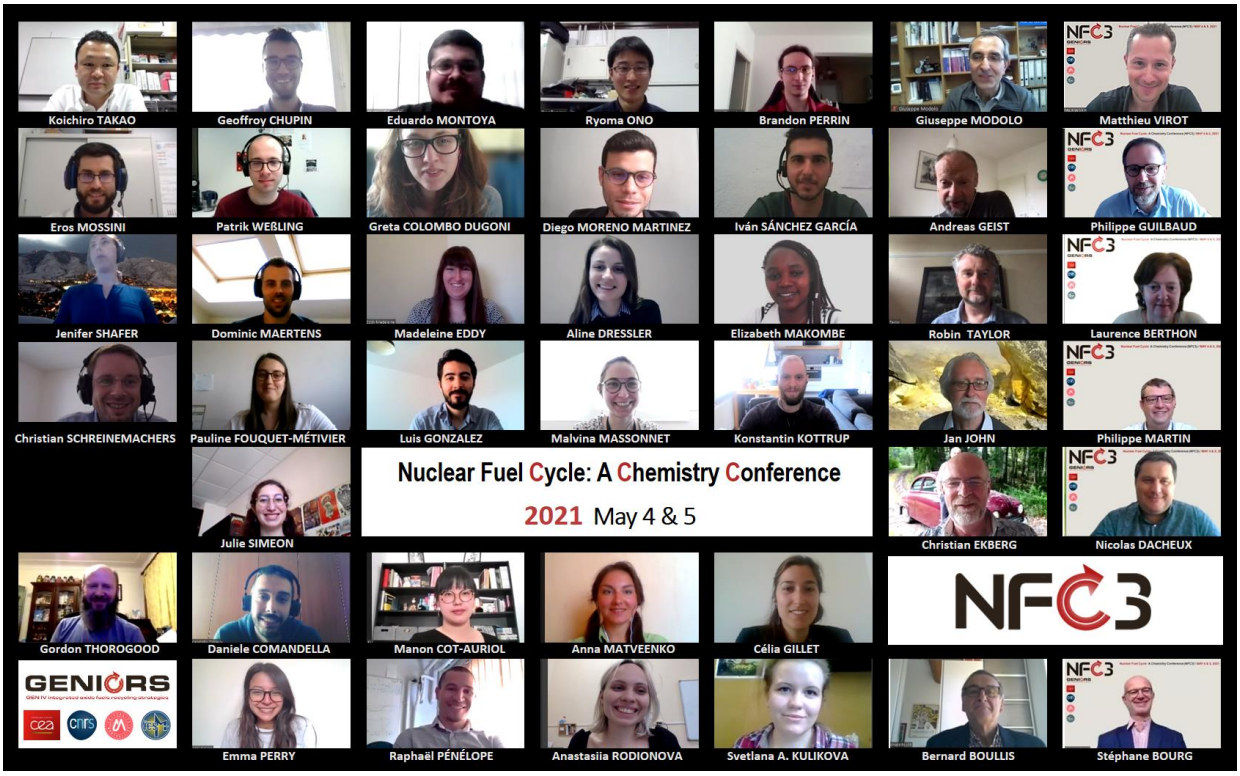
researchers, former PhD students of the GENIORS project were selected for 2 of the 6 keynotes.

A poll was organized at the end of the meeting in order to check if this NFC3 edition satisfied the attendees, if they expected to attend any potential future editions (on-site or virtual forms) and what was, to their mind, the better frequency of such an event. The results of this poll were very positive and encouraging for the organization of further NFC3 editions.



PROGRAM

ACTINIDE AND FISSION PRODUCT CHEMISTRY

ACT K1	*Coordination Chemistry of Actinide(VI, IV) Nitrates for Development of Nuclear Fuel Materials Selective Precipitation (NUMAP) Reprocessing*	Koichiro TAKAO Tokyo Institute of Technology
ACT O1	*Synthesis and Characterization of a hexanuclear plutonium(IV) in acetate solution from EXAFS and DFT*	Geoffroy CHUPIN CEA
ACT O2	*DFT Study on the Chemical Behavior of High Yielding Fission Products (Cs-137, I-129) in a UO_2 Framework*	Eduardo MONTOYA University of Nevada, Las Vegas

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ACT O3	*Crystal Structures of Tetravalent f-Block Metals with Bis(2-pyrrolidone) Linker Molecules at Different HNO_3 Concentration*	Ryoma ONO Tokyo institute of technology
ACT O4	*Plutonium alpha radiolysis of nitric acid solutions*	Brandon PERRIN CEA

ACTINIDES SEPARATION

SEP K1	PyTri-Diol behavior at conditions relevant for i-SANEX and EURO-GANEX processes	Eros MOSSINI Politecnico di Milano
SEP O1	Activating the Aromatic Core of the Water-soluble Complexing Agent PTD	Patrik WEßLING Heidelberg University
SEP O2	Deep Eutectic Solvents: promising co-solvents for Spent Nuclear Fuel reprocessing	Greta COLOMBO DUGONI Politecnico di Milano
SEP O3	Speciation in solvent extraction organic phases studied by molecular dynamics simulations: bifunctional amidophosphonic acid extractants	Diego MORENO MARTINEZ CEA
SEP O4	Development of a gamma irradiation loop and the evaluation of the EURO-GANEX process resistance	Iván SÁNCHEZ GARCÍA CIEMAT
SEP K2	Technical Opportunities for Decreasing Cost and Proliferation Hazard Associated with Reprocessing Technologies	Jenifer SHAFER ARPA-E
SEP O5	Use of TBP and N,N-dialkylamides for uranium extraction with 25 mm annular centrifugal contactors: effect of residence time on extraction performance	Dominic MAERTENS SCK CEN / KU Leuven
SEP O6	How Aqueous Complexes Shape ALSEP Kinetics	Madeleine EDDY Colorado School of Mines
SEP O7	The effect of immobilization mode of amidophosphonate ligands onto silica surfaces on the uranium extraction efficiency	Aline DRESSLER CEA
SEP O8	Malonamides for the multi-recycling of nuclear spent fuel.	Elizabeth MAKOMBE CEA/ICSM

ACTINIDE MATERIALS: NUCLEAR FUELS AND RADWASTE MATRICES

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MAT K1	Structural changes of Nd- and Ce-doped ammonium diuranate during the conversion to $U_{1-y}Ln_yO_{2\pm x}$	Christian SCHREINEMACHERS Forschungszentrum Jülich GmbH
MAT O1	Study of melting temperatures of $(U,Pu)O_2$ SFRs fuels: influence of Pu and Am contents and oxygen stoichiometry	Pauline FOUQUET-MÉTIVIER CEA
MAT O2	Chromium doped Uranium Nitride as an advanced technology fuel	Luis GONZALEZ Chalmers University of Technology
MAT O3	Impact of the method of preparation and sintering conditions on the dissolution of $(U,Ce)O_{2\pm\delta}$	Malvina MASSONNET ICSM/CEA
MAT O4	Molten salt irradiation and waste management	Konstantin KOTTRUP NRG
MAT O5	Sintering map approach on MOX SFR nuclear fuels with various plutonium contents	Julie SIMEON CEA
WASTE MANAGEMENT & GEOLOGICAL REPOSITORY		
WG K1	$Pb_2Tc_2O_{6.86}$, a Stable Valence V Technetium Oxide?	Gordon THOROGOOD ANSTO
WG O1	Electrospun microporous membranes loaded with cerium oxide nanoparticles for the decontamination of nuclear wastewaters	Daniele COMANDELLA European Commission - JRC
WG O2	Sonochemical conversion of UO_3 into U(VI) intrinsic colloids in near-neutral conditions	Manon COT-AURIOL CEA/ICSM
WG O3	Matrices for the immobilization of waste from pyrochemical processing of spent nuclear fuel	Anna MATVEENKO Lomonosov Moscow State University
WG O4	Effects of complex irradiation scenarios on ISG nuclear glass structure, properties and leaching behaviour	Célia GILLET CEA/ICSM
WG O5	The Fabrication and Oxidative Dissolution of Mixed Oxide Fuels under the Reducing Conditions of a Geological Disposal Facility	Emma PERRY University Of Cambridge

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WG O6	Development of iodine filters directly convertible into conditioning matrices	Raphaël PÉNÉLOPE CEA
WG O7	Sorption and spatial distribution of radionuclides onto fractured rocks of the exocontact zone of the Nizhnekansky granitoid massif	Anastasiia RODIONOVA GEOKHI RAS
WG O8	Immobilization of metal chlorides in magnesium potassium phosphate compound	Svetlana A. KULIKOVA Vernadsky Institute, Russian Academy of Sciences

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