

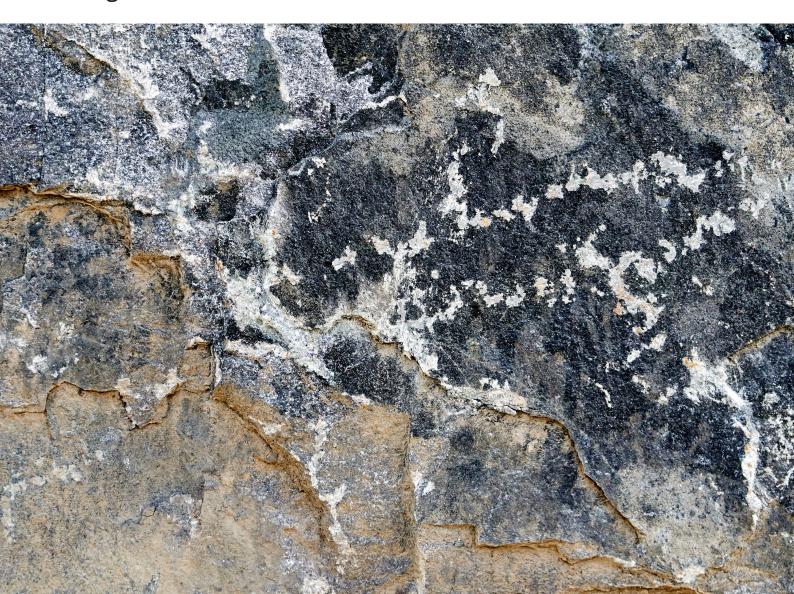


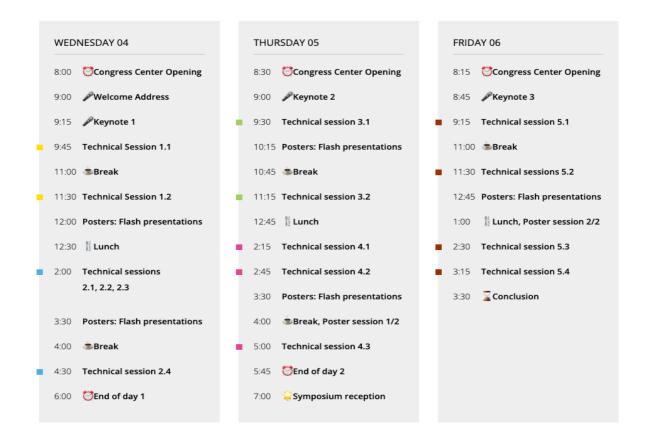
## **NUWCEM 2022 - Detailed program**

4th International Symposium on Cement-Based Materials for Nuclear Wastes

May 4 to 6, 2022

• Avignon, France





## Technical sessions

T01 • Design of cement-waste packages

1.1 · Methodologies to design cement-waste packages

♥ Registration • "Palais des Papes" Congress Centre Main Entrance

1.2 · Addition of getters

T02 • Understanding cement chemistry

2.1 · Cement hydration process

2.2 · Methods of cement hydration monitoring

2.3 · Mechanisms involved in cement-waste

**2.4** • Phases in cementitious systems

T03 · Alternative binders

3.1 · Magnesium phosphate cements

3.2 · Alkali-activated binders

T04 · Problematic wastes

4.1 · Ion exchange resins

4.2 · Metallic waste

4.3 · Organic wastes

T05 • Durability confining properties

5.1 · Retention of radionuclides

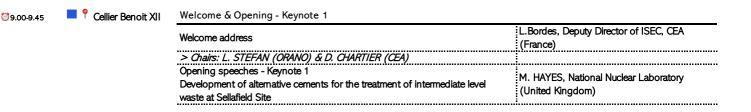
5.2 · Leaching

5.3 · Behaviour under irradiation

5.4 · Modelling of long term evolution

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Design of cement waste packages	Х				Keynote	х	Х	)	(
Understanding cement chemistry	Х		Г	ı	Technical session	х	Х	)	
Alternative binders		Х			Posters session	х	Х	)	
Problematic wastes		х	Г		Flash presentations	х	Х	•	:
Durability, confining properties			х	I				I	

## MAY, WEDNESDAY 4



		IAEA's perspective on the status of cement-based conditioning in the	:
		processing radioactive waste	W. MEYER, IAEA (Austria)
		Cementing a Radioactive Barium Sulphate Precipitate	A. WAELLISCH, Paul Scherrer Institute (Switzerland)
		On the transferability of research on surrogate material towards the real radioactive waste	E. COPPENS, ONDRAF/NIRAS (Belgium)
		Thermal analysis of a large industrial container (2.7 m3) filled up with	P. GIRARDIN, CEA (France)
		geopolymer mortar  Delayed ettringite formation thermal management in cement grout for the conditioning of long-lived medium-level radioactive waste	I. RUPP, EDF (France)
11.00-11.30	↑ Paneterie   🗪		•••••••••••••••••••••••••••••••••••••••
	,	> Chairm A WASH LISCH (BSI) S.N. COURTOIS (CEA)	
_	н.	> Chairs: A. WAELLISCH (PSI) & N. COURTOIS (CEA)  Evaluation of the diffusion coefficient with tritiated water by a comparative	A. ROOSES, ORANO (France) & J. MULLER
11.30-12.00	Cellier Benoit XII	method in durable and confining concrete as defined by ANDRA	ANDRA (France)
		Multiphase (oil/water/sludge) radioactive liquid waste solidification with polymer and cement – Sogin Experience	F. PANCOTTI, SOGIN (Italy)
12.00-12.30	<ul><li>Cellier Benoit XII</li></ul>	Flash presentations	
		From theory to practice – demonstration of the transferability of early age properties between a simulated and a real life ILLW in a cementitious matrix	G. VANLOMMEL, BELGOPROCESS (Belgiur
		Formulation development and process qualification activities for direct cementation of small volume of alpha contaminated aqueous waste	F. PANCOTTI, SOGIN (Italy)
		Strategy to immobilize acidic high-level liquid waste in a blended cement	E. FERREIRA, SCK (Belgium)
		Development of a cementation process for the conditioning of legacy waste (HAO project)	AL DE PERTHUIS, ORANO (France)
		Development of a cementation process for the conditioning of legacy waste (DFG project)	J. MARGUERIE, ORANO (France)
		Reuse of hardened Portland cement as a part of cement matrix for nuclear waste encapsulation	H. KINOSHITA, University of Sheffield (Unit Kingdom)
		Production of geometry-standardized concrete containers with customized inner parts for the conditioning of radioactive waste	A. LECONTE, ORANO (France)
		inner parts for the conditioning of radioactive waste	·
•			
12.30-14.00	Paneterie   Lunc	h	
	Paneterie   Lunc	> Chairs: B. LOTHENBACH (EMPA) & C. CAU DIT COUMES (CEA) Understanding cement chemistry	
		> Chairs: B. LOTHENBACH (EMPA) & C. CAU DIT COUMES (CEA) Understanding cement chemistry  Early-age hydration of anhydrous calcium aluminate phases in suspension	J.B CHAMPENOIS, CEA (France)
		> Chairs: B. LOTHENBACH (EMPA) & C. CAU DIT COUMES (CEA) Understanding cement chemistry  Early-age hydration of anhydrous calcium aluminate phases in suspension  Effects of phosphates on calcium aluminate cement under hydrothermal	H. KINOSHITA, University of Sheffield (Unit
		Chairs: B. LOTHENBACH (EMPA) & C. CAU DIT COUMES (CEA) Understanding cement chemistry  Early-age hydration of anhydrous calcium aluminate phases in suspension  Effects of phosphates on calcium aluminate cement under hydrothermal conditions Investigation of the physico-chemical properties of cements by electrochemical	H. KINOSHITA, University of Sheffield (Unit Kingdom)
		Chairs: B. LOTHENBACH (EMPA) & C. CAU DIT COUMES (CEA)     Understanding cement chemistry  Early-age hydration of anhydrous calcium aluminate phases in suspension     Effects of phosphates on calcium aluminate cement under hydrothermal conditions     Investigation of the physico-chemical properties of cements by electrochemical impedance spectroscopy.	H. KINOSHITA, University of Sheffield (Unit Kingdom) S. DELPECH, IJCLab (France)
		Chairs: B. LOTHENBACH (EMPA) & C. CAU DIT COUMES (CEA) Understanding cement chemistry  Early-age hydration of anhydrous calcium aluminate phases in suspension Effects of phosphates on calcium aluminate cement under hydrothermal conditions Investigation of the physico-chemical properties of cements by electrochemical impedance spectroscopy Exploiting X-ray CT to understand the behavior a new clinker substitute for cement	H. KINOSHITA, University of Sheffield (Unit Kingdom)
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		Chairs: B. LOTHENBACH (EMPA) & C. CAU DIT COUMES (CEA) Understanding cement chemistry  Early-age hydration of anhydrous calcium aluminate phases in suspension Effects of phosphates on calcium aluminate cement under hydrothermal conditions Investigation of the physico-chemical properties of cements by electrochemical impedance spectroscopy Exploiting X-ray CT to understand the behavior a new clinker substitute for cement	H. KINOSHITA, University of Sheffield (Unit Kingdom) S. DELPECH, IJCLab (France) A. KOZLOWSKI, University of Strathclyde (United Kingdom) N. COURTOIS, CEA (France) X. GAONA, Karlsruhe Institute of Technolog
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> Chairs: G. LE SAOUT (IMT Mines Alès) & J.B. CHAMPENOIS (CEA)

Molecular dynamic simulations of Be(II) adsorption on C-S-H phases	I. ANDRONIUK, Karlsruhe Institute of Technology (Germany)
Interaction of CsCl and CsI aqueous solutions with ettringite probed by atomistic computer simulations	A.G. KALINICHEV, SUBATECH (France)
Effect of alkali hydroxide on calcium silicate hydrate (C-S-H)	Y. YAN, EMPA (Switzerland)
A CASH+ solid solution for modeling cation uptake in cementitious materials used in waste management	G.D MIRON, Paul Scherrer Institut (Switzerland)
Development of thermodynamic data for Mg-Al layered double hydroxide	E. BERNARD, University of Bern & EMPA
containing carbonate, sulfate, chloride and nitrate	(Switzerland)
Structural incorporation pathways of FeIII into zeolite frameworks in cement-	B. MA, EMPA (Switzerland)
relevant environments	B. MA, LMI A (SWIZERATO)

● 18.00 End of day 1

## MAY, THURSDAY 5

8.30	•	Registration • "Pal	ais des Papes" Congress Center Main Entrance	
0.00-09.30	<b>T</b>	<sup>™</sup> Cellier Benoit XII	> Chairs: W. MEYER (IAEA) & H. KINOSHITA (The University of Sheffield) Keynote 2	
			Effect of Ca, alkali, aluminum and temperature on alkali silica reaction	B. LOTHENBACH, EMPA (Switzerland)
9.30-10.15	II T	Cellier Benoit XII	Alternative binders	
			Towards the optimization of magnesium phosphate cements formulations for reactive metals encapsulation	R. FERNANDEZ, Autonomous University of Madrid (Spain)
			Leaching behavior of magnesium phosphate cement pastes  Design and characterization of cement-based materials for dihydrogen trapping	L. DIAZ CASELLES, CEA (France)
			Design and characterization of centent-based materials for dinydrogen dapping	C. CAU DIT COUMES, CEA (France)
0.15-10.45	• 1	Cellier Benoit XII	Flash presentations	
			Hydrogen sequestration in MnO2/Ag2O-functionalized alkali-activated materials	C. REEB, CEA (France)
			immobilizing radioactive oil Optimize cementation of spent ion exchange resins by resin liquefaction	R. LEHR, FRAMATOME GmbH (Germany)
			Compatibility of stainless steel 316L with geopolymer-based waste	M. ARBEL-HADDAD, Nuclear Research Cer
			immobilization matrices	Negev (Israel)
			Trapping efficiency of a Portland-based mortar incorporating a tritium getter for	C.A. DAVY, Centrale Lille (France)
			radioactive waste conditioning	C.A. DAVI, Caltuale Lille (Flance)
			Innovative and green pre-impregnation solution for the disposal of radioactive liquid organic waste	I. MOSCHETTI, Politecnico di Milano (Italy
			Aluminosilicate nanomaterials for the encapsulation of organic waste in a	E. PUEL, CEA (France)
			Solidification of liquid scintillation waste	A. BARANYI, MVM Paks NPP (Hungary)
0.45-11.15	; "	Paneterie   🗪	> Chairs: G. BAR NES (NRCN) & D. LAMBERTIN (CEA)	
		Paneterie   ©	> Chairs: G. BAR NES (NRCN) & D. LAMBERTIN (CEA) Alternative binders  Safe and efficient cementation of challenging radioactive wastes using alkali-	D. GEDDES, University of Sheffield (United
0.45-11.15 1.15-12.45			Alternative binders  Safe and efficient cementation of challenging radioactive wastes using alkaliactivated materials	Kingdom)
			Alternative binders  Safe and efficient cementation of challenging radioactive wastes using alkaliactivated materials  Cs immobilization in composite crystalline-amorphous geopolymers elucidated	Kingdom) M. ARBEL-HADDAD, Nuclear Research Cer
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Flash presentations Evaluation of assembled organic liquids incorporation on geopolymer matrix: M. DE CAMPOS, CEA (France) case of viscous oils and greases Innovative and sustainable tuff-based geopolymers for encapsulation of A. SANTI, Politecnico di Milano (Italy) radioactive solid organic waste O. ALMENDROS, CIEMAT (Spain) 233U sorption on portlandite and the effect of organic compounds Sorption of organics and uranium to CASH J.D. BEGG, Amphos 21 (Spain) J. KITTNEROVA, Czech Technical University in Sorption of uranium and lead on cement materials Prague (Czech Republic) X. GAONA, Karlsruhe Institute of Technology Degradation products of UP2 filter aid material and their impact on radionuclide retention in cementitious systems (Germany) Sorption of Eu in presence of EDTA and oxalate on CSH-Phases A. THUMM, KIT-INE (Germany) Interaction of europium with cementitious materials in the presence of M. BURESOVA, Czech Technical University in Prague (Czech Republic) organic substances > Chairs: A. ROOSES (ORANO) & A. POULESQUEN (CEA) 17.00-17.45 T Cellier Benoit XII Problematic wastes The effect of viscosity ratio on the solidification of liquid organic waste using A. HASNAOUI, CEA (France) geopolymers 3D X Ray micro-tomography as a tool for the formulation of geopolymer-oil C.A DAVY. Centrale Lille (France) emulsions C. REEB, CEA (France) A study on mineral oil emulsification in alkali-activated materials Espace Jeanne Laurent | Conference reception MAY, FRIDAY 6 Registration • "Palais des papes" Congress Center Main Entrance > Chairs: X. GAONA (KIT) & G. KOSAKOWSKI (PSI) ♥08.45-09.15 Cellier Benoit XII Keynote 3 Consequences of atmospheric carbonation: shrinkage & cracking S. POYET, CEA (France) Durability, confining properties Research within the CORI WP in EURAD focusing on cement-organics-N. MACE, CEA (France) radionuclide-interactions N. MACE, CEA (France) Radionuclide migration studies performed with Task 4 of CORI workpackage Radiolysis effects onto europium uptake by cement-based materials containing S. LEGAND, CEA (France) superplasticizers Impact of formate, citrate and gluconate on the uptake of radionuclides by R.E. GUIDONE, EMPA & KIT-INE (Switzerland / Germany) cement: study of the binary and ternary systems cement-L and cement-RN-L Y. JO, Karlsruhe Institute of Technology Impact of ISA and chloride on the uptake of Nb(V) by cement (Germany) Adsorption of short-chain organic molecules and Th onto degraded hardened D. GARCIA, Amphos21 (Spain) cement pastes and CSH The effect of organic molecules on the radionuclide behavior in cement-based P. HENOCQ, ANDRA (France) **11.00-11.30** > Chairs: C. DAVY (ECL) & S. POYET (CEA) Durability, confining properties Short-term impact of simulated bentonite water on the transport properties in M.C. ALONSO, IETcc-CSIC (Spain) high pH FEBEX-plug concrete. Correlation with long-term performance Chemo-mechanical characterization of cement pastes placed in magnesian C. DEWITTE, IRSN & INSA Toulouse (France) Impact of calcareous water on the chemo-mechanical behavior of cement M. NEJI, IRSN (France) matrices

Sr immobilization in high- and low-pH OPC systems - controlling phases,

Fire-resistant geopolymer for an application in geological radioactive waste

mechanisms and influence of accelerated carbonation

disposal

M.E SHINER, Ben Gurion University of the

S. ROSSIGNOL, IRCER (France)

Negev (Israel)

©12.45-13.00 ● P Cellier Benoit XII

Flash presentations

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Ī	Leaching behaviour of cemented waste with high nitrate content	E. FERREIRA, SCK CEN (Belgium)
	Iradioactive waste of B-1() enriched boric acid: B. Ca. Si. Al. S and	M. ROSTAMIPARSA, Eötvös Loránd University (Hungary)
	Strontium release from wollastonite-based brushite cement under semi- dynamic leaching conditions	J. JDAINI, CEA (France)
	Water transfers (imbibition, drying) in cementitious materials followed by MRI (Magnetic Resonance Imaging)	H. DIALLA, CEA (France)

> Chairs: P. HENOCQ (ANDRA) & F. CHUPIN (CEA)

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	Assessment of radiolytic hydrogen gas release from ILW-LL cemented waste	A. ROOSES, ORANO (France)
	Effect of sodium nitrate on radiolytic gas production of Portland cement-based materials containing blast furnace slag	D. CHARTIER, CEA (France)
	Assessing the impact of chemical processes on the long-term evolution of	G. KOSAKOSWKI, Paul Scherrer Institut
	waste packages by geochemical modelling	(Switzerland)
	Chemo-mechanical behavior of CEM I pastes subjected to low-concentration	J. POUYA, IRSN & MINES ParisTech (France)

**16.00** 

END OF THE CONFERENCE