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International Conference on Alkali Activated
Materials and Geopolymers: Versatile Materials
Offering High Performance and Low Emissions

Proceedings

5-27-2018

Conference Program

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Program

Alkali Activated Materials and Geopolymers: Versatile Materials Offering High Performance and Low Emissions

May 27 - June 1, 2018

Hotel Dos Templarios, Tomar, Portugal

Conference Chairs

John L. Provis

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Jannie S. J. van Deventer, Zeobond Group, Australia

Previous conferences in this series:

Geopolymers

May 24-29, 2015

Herrnstein, Austria

Conference Chairs:

Cristina Leonelli (University of Modena and Reggio Emilia, Italy)
Aldo R. Boccaccini (University of Erlangen-Nuremberg, Germany)
Waltraud M. Kriven (University of Illinois at Urbana-Champaign, USA)
Arie van Riessen (Curtin University, Australia)

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(Deutsche Keramische Gesellschaft e.V. / DKG)**

The American Ceramic Society

Sunday, May 27, 2018

17:00 – 19:00	Conference Check-in
19:30 – 21:30	Reception and Dinner

Room locations and notes

- General Sessions will be in Infante II.
- Poster Sessions will be the Convento Room.
- Audio, still photo and video recording by any device (e.g., cameras, cell phones, laptops, PDAs, watches) is strictly prohibited during the technical sessions, unless the author and ECI have granted prior permission.
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Monday, May 28, 2018

- 07:30 - 09:00 Breakfast Buffet
- Invited Keynote**
- 09:00 - 09:40 **Looking back to guide us on how to move forward for geopolymers**
Arie van Riessen, Curtin University, Australia
- 09:40 - 10:00 **Investigation of the relationship between the condensed structure and the chemically bonded water content in the network of geopolymer cements**
Herve Tchakoute Kouamo, University of Yaounde I, Cameroon
- 10:00 - 10:20 **Real soils versus fake soils: Does something other than clay minerals influence geopolymerisation behavior in real soils?**
Alastair Marsh, University of Bath, United Kingdom
- 10:20 - 10:50 Coffee Break
- 10:50 - 11:10 **Hydration of clinker phases in alkaline conditions**
María Jose Sánchez-Herrero, Eduardo Torroja Institute, CSIC, Spain
- 11:10 - 11:30 **Molecular model of geopolymers with increasing level of disorder in the atomic structure**
Francesca Lolli, Newcastle University, United Kingdom
- 11:30 - 11:50 **Aluminosilicate network formation during geopolymerization followed by in-situ ²⁷Al nutation NMR**
Virginie Benavent, Laboratoire des Sciences et Ingénierie de la Matière Molle, France
- 11:50 - 12:10 **Experimental study and numerical simulation of the dissolution of blast furnace slag in alkaline solution**
Yibing Zuo, Delft University of Technology, Netherlands
- 12:10 - 12:30 **Synthetic glass with high alkali-reactivity and near-zero RM-CO₂ emissions**
Paivo Kinnunen, University of Oulu, Finland
- 12:30 - 14:00 Lunch
- 14:00 - 14:20 **Understanding the relationship between micro and macro-scale properties in sodium silicate activated slag-fly ash binders**
Waltraud M. Kriven, University of Illinois at Urbana-Champaign, USA
- 14:20 - 14:40 **Retardation in alkali-activated materials via zinc oxide: Mechanism and implications**
Nishant Garg, Princeton University, USA

Monday, May 28, 2018 (continued)

- 14:40 - 15:00 **Rheological behavior of fresh inorganic polymer paste: Polymer bridging effect of the alkali silicate solution**
Glenn Beersaerts, KU Leuven, Belgium
- 15:00 - 15:20 **Amorphous, self-healed, geopolymers (ASH-G and ceramics (ASH-C) made by the geopolymer processing route**
Patrick F Keane, University of Illinois at Urbana-Champaign, USA
- 15:20 - 15:50 Coffee Break
- 15:50 - 16:10 **Effect of chemical structure on the efficiency of shrinkage reducing admixtures in alkali activated systems**
Lukas Kalina, Brno University of Technology, Czech Republic
- 16:10 - 16:30 **Influence of different types of superplasticizers on one-part alkali-activated slag mortars**
Elena Crotti, Università Degli Studi di Bergamo, Italy
- 16:30 - 16:50 **Development of geopolymer composites reinforced with fiber felts using an industrial approach**
Alberto Conte, University of Padova, Italy
- 16:50 - 17:10 **Drying shrinkage behavior of metakaolin-based and bamboo fiber reinforced geopolymers**
Ruy A. Sá Ribeiro, INPA-National Institute for Amazonian Research, Brazil
- 17:30 - 19:00 **Poster Session**
- 19:30 - 20:30 Dinner

Tuesday, May 29, 2018

- 07:30 - 09:00 Breakfast Buffet
- Invited Keynote**
- 09:00 - 09:40 **Environmentally friendly immobilization of radioactive wastes in an alkali activated cement matrix**
Pavel Krivenko, Kyiv National University of Construction and Architecture, Ukraine
- 09:40 - 10:00 **Acid geopolymer materials based on different aluminosilicate sources**
Sylvie Rossignol, IRCER, France
- 10:00 - 10:20 **Study of geopolymerization mechanisms by ²⁷Al-NMR and calorimetry correlation**
Julien Aupoil, CEA Marcoule, France
- 10:20 - 10:50 Coffee Break
- 10:50 - 11:10 **Use of soda lime glass waste as silica supplier in fly ash based geopolymers**
Nicoletta Toniolo, Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany
- 11:10 - 11:30 **Performance of sodium carbonate/ silicate activated slag materials**
Susan A. Bernal, [John Provis](#), The University of Sheffield, United Kingdom
- 11:30 - 11:50 **Effect of recycled geopolymer concrete aggregate on strength development and consistence of Portland cement concretes**
Napoleana-Anna Chaliasou, University of Bath, United Kingdom
- 11:50 - 12:10 **Factors influencing setting time of alkali activated blast furnace slag**
Henk Nugteren, Delft University of Technology, Netherlands
- 12:10 - 12:30 **Autogenous shrinkage induced stress of alkali activated slag and fly ash concrete under restraint condition**
Zhenming Li, Delft University of Technology, Netherlands
- 12:30 - 14:00 Lunch
- 14:00 - 14:20 **Ultra-high performance alkali activated material with silica fume and nanosilica**
Alexander Wetzel, University of Kassel, Germany
- 14:20 - 14:40 **Effect of geopolymer composition and curing conditions on efflorescence in lightweight porous geopolymers**
Sujeong Lee, KIGAM, South Korea
- 14:40 - 15:00 **Understanding the autogenous shrinkage in alkali-activated slag/fly-ash blends**
Siva Uppalapati, KU Leuven, Belgium

Tuesday, May 29, 2018 (continued)

- 15:00 - 15:20 **Combining chemical and mechanical foaming in geopolymer foam concretes**
Ailar Hajimohammadi, The University of Melbourne, Australia
- 15:20 - 15:50 Coffee Break
- 15:50 - 16:10 **Steel corrosion in different alkali-activated mortars**
Nina Gartner, Slovenian National Building and Civil Engineering Institute (ZAG), Slovenia
- 16:10 - 16:30 **Steel reinforcement corrosion in alkali-activated fly ash mortars**
Petr Hlaváček, Bundesanstalt für Materialforschung und -prüfung (BAM), Germany
- 16:30 - 16:50 **On the acid resistance of alkali-activated cements: What role does magnesium play?**
Juan Pablo Gevaudan, University of Colorado at Boulder, USA
- 16:50 – 17:10 **Structure, acid-resistance and high-temperature behavior of silica-based one-part geopolymers and geopolymer-zeolite composites**
Gregor J. G. Gluth, Bundesanstalt für Materialforschung und -prüfung (BAM), Germany
- 17:30 - 19:00 **Poster Session**
- 19:30 - 20:30 Dinner

Wednesday, May 30, 2018

- 07:30 - 09:00 Breakfast Buffet
- 09:00 - 09:20 **Assessing the long-term structural changes of metakaolin geopolymers encapsulating strontium loaded ion-exchanger**
Xinyuan Ke, The University of Sheffield, United Kingdom
- 09:20 - 09:40 **Synthesis of geopolymer foams for decontamination of liquid nuclear waste**
Svetlana Petlitckaia, CEA, France
- 09:40 - 10:00 **Retention of Re in metakaolin based geopolymer in the presence of an organic reductant – an experimental study**
Ofra Klein-BenDavid, Nuclear Research Center Negev, Israel
- 10:00 - 10:20 **Stabilization of sulphidic mine tailings with MgO activated blast furnace slag**
Minna Sarkkinen, KUAS, Finland
- 10:20 - 10:50 Coffee Break
- 10:50 - 11:10 **MK-GGBS foams: Relation between mechanical parameters and morphological parameters**
Martin Cyr, LMDC - Université de Toulouse, France
- 11:10 - 11:30 **Evaluation of alkali-activated binders suitability for the stabilization/solidification of tunnel boring muds**
Thomas Wattez, Université de Toulouse, France
- 11:30 - 11:50 **Geopolymers for hazardous cations and anions inertization**
Cristina Leonelli, University of Modena and Reggio Emilia, Italy
- 11:50 - 12:10 **Cesium incorporation in metakaolin-based K-geopolymer**
Yuka Morinaga, Hokkaido University, Japan
- 12:15 - 13:45 Lunch
- 14:00 - 17:00 Excursion: Guided tour of Convento de Cristo and historic Tomar
(Please meet in hotel lobby.)
- 17:00 Dinner on your own in Tomar
(ECI will provide a list of restaurants)

Thursday, May 31, 2018

- 07:30 - 09:00 Breakfast Buffet
- 09:00 - 09:20 **Hybrid concrete: Alternative future**
Cyril Attwell, ARC Innovations, South Africa
- 09:20 - 09:40 **Development of alkali activated adhesive applicable for alkali activated panels**
Vilma Ducman, Slovenian National Building and Civil Engineering Institute, Slovenia
- 09:40 - 10:00 **30 cubic meters batching, delivering, and pouring of activated fly ash concrete**
Nawamonwan Sirima, Electricity Authority of Thailand, Thailand
- 10:00 - 10:20 **Geosil – ready to use alkaline activator solutions for geopolymers**
Martin Leute, Wöllner Austria GmbH, Austria
- 10:20 - 10:50 Coffee Break
- 10:50 - 11:10 **PQ Curesil™ - Alkaline silicate activators for geopolymer**
Abraham Araya, PQ Corporation, United Kingdom
- 11:10 - 11:30 **Practical approaches for the development of alkali activated concrete - a durability- and sustainability-driven optimization**
Katja Dombrowski-Daube, Technische Universität Bergakademie Freiberg, Germany
- 11:30 - 12:30 **Panel Discussion – Pathways to uptake of alkali-activation: how, where and when?**
- 12:30 - 14:00 Lunch
- 14:00 - 14:20 **Low-temperature alkaline activation of feldspathic solid solutions: Development of high strength geopolymers**
Elie Kamseu, MIPROMALO, Italy
- 14:20 - 14:40 **Development of a new alkali-activated binder incorporating dredged sediments**
Reine Karam, IMT Lille Douai, University of Lille, France
- 14:40 - 15:00 **Sustainable alkali binders: Waste activating wastes**
Ana Fernández-Jiménez, IETcc-CSIC, Spain
- 15:00 - 15:20 **Alkali activation of fly ashes, Part I: Mechanical pre-processing for the improvement of the fly ash reactivity**
Olga Maltseva, IETcc-CSIC, Spain
- 15:20 - 15:50 Coffee Break

Thursday, May 31, 2018 (continued)

- 15:50 - 16:10 **Alkali-activated mineral wools**
Juho Yliniemi, University of Oulu, Finland
- 16:10 - 16:30 **Silica source for formation of C-S-H in waste sediment-steel slag mixtures**
Kanakano Toda, Hokkaido University, Japan
- 16:30 - 16:50 **Lightweight foamed geopolymer**
Oday Hussein, The University of Sheffield, United Kingdom
- 16:50 - 17:10 **Study on surface degradation of LCFA-GGBF geopolymers by partial water absorption and silane impregnation techniques**
Kazuo Ichimiya, National Institute of Technology, Oita College, Japan
- 17:30 - 19:00 **Poster Session**
- 19:30 - 21:00 Gala Dinner

Friday, June 1, 2018

- 07:30 - 09:00 Breakfast Buffet
- 09:00 – 09:20 **Geopolymer-bound intumescent coatings for fire protection**
Gregor J. G. Gluth, Bundesanstalt für Materialforschung und -prüfung (BAM), Germany
- 09:20 - 09:40 **Achievement and exploitation of porous geopolymer-based spheres**
Elettra Papa, ISTECCNR, Institute of Science and Technology for Ceramics, Italy
- 09:40 - 10:00 **Multi-scale analysis on soil improved by alkali activated fly ashes**
Enza Vitale, University of Cassino and Southern Lazio, Italy
- 10:00 - 10:20 **Immense potential of geopolymeric nanomaterials for sustainability applications**
Dong-Kyun Seo, Arizona State University, USA
- 10:20 - 10:50 Coffee Break
- 10:50 - 11:10 **Geopolymers as inorganic binder in 3D printing application in construction**
Vera Voney, ETH Zurich, Switzerland
- 11:10 - 11:30 **Investigation of lightweight geopolymer mortars as fireproofing coatings**
Lorenza Carabba, University of Bologna, Italy
- 11:30 - 11:50 **Lightweight insulating geopolymer material based on expanded perlite**
Annalisa Natali Murri, National Research Council of Italy, Institute of Science and Technology for Ceramics (CNR-ISTEC), Italy
- 12:30 - 14:00 Lunch and conference closure

Poster Presentations

1. **Behavior of shrinkage reducing admixtures based on polyether structure in various alkaline solutions**
Eva Bartonickova, Brno University of Technology, Czech Republic
2. **New insights into the role of hydroxide ions and silicate species during geopolymerization**
Jean-Baptiste Champenois, CEA, France
3. **Synthesis of geopolymer emulsions**
Arnaud Poulesquen, CEA Marcoule, France
4. **Geopolymer-based bricks may be the next generation of bricks: A case study of MINEALITHE as an alkaline activator**
Nicolas Youssef, Centrale Lille, Université Libanaise, France
5. **Geopolymers including CDW for application as a building material**
Matteo Panizza, CNR ICMATE, Italy
6. **Geopolymers based on natural zeolite and metazeolite**
Henk W. Nugteren, Delft University of Technology, Netherlands
7. **Alkali activation of MSWI bottom ash: Effects of the $\text{SiO}_2/\text{Na}_2\text{O}$ ratio**
Boyü Chen, Delft University of Technology, Netherlands
8. **PVA fiber/matrix interface characterization in alkali-activated slag/fly ash system: Effect of $\text{SiO}_2/\text{Na}_2\text{O}$ ratio**
Shizhe Zhang, Delft University of Technology, Netherlands
9. **Mechanical properties and creep behaviour of an alkali-activated concrete**
Albina Kostiuhenko, Delft University of Technology, Netherlands
10. **Metakaolin based geopolymers as soil stabilizers**
Dotan Gabber, Nuclear Research Center Negev, Israel
11. **Investigation on microstructure and mechanical properties of FA/GGBS -based geopolymer after exposure at elevated temperature**
Apriany Saludung, Hiroshima University, Japan
12. **Effect of microstructure on physical properties of blast furnace slag - fly ash based alkali activated materials**
Kenta Sasaki, Hokkaido University, Japan
13. **Alkali activation of fly ashes part II: Mechanochemical pre-processing as way to optimize the reactivity**
Angel Palomo, IETcc-CSIC, Spain
14. **Strength and elastic behavior of metakaolin-based and bamboo fiber reinforced geopolymers**
Ruy A. Sá Ribeiro, INPA-National Institute for Amazonian Research, Brazil
15. **Geopolymer-zeolite composites for CO_2 adsorption**
Elettra Papa, ISTECC-CNR, Institute of Science and Technology for Ceramics, Italy

16. **Geopolymer oxygen carriers for chemical-looping combustion**
Annalisa Natali Murri, ISTECCNR, Institute of Science and Technology for Ceramics, Italy
17. **Mixture optimization of an alkali-activated steel slag to maximize binder strength using optimal design of experiments**
Pavel Leonardo Lopez Gonzalez, KU Leuven, Belgium
18. **Impact of sodium aluminate on the hydration process of alkali-activated ground granulated blast furnace slag**
Artur Kiiashko, LMT-Cachan, CNRS/Paris-Saclay University, France
19. **Reinventing the structural fired clayey bricks through the geopolymerisation of laterites**
Elie Kamseu, Local Materials Promotion Authority, Cameroon
20. **Different fiber materials as reinforcement for geopolymer composite**
Meital Cahana, NRCN, BGU, Israel
21. **Effect of sulfides in the passive layer of steel reinforcement in alkali-activated slags**
Susan A. Bernal, [John Provis](#), The University of Sheffield, United Kingdom
22. **Performance evaluation of metakaolin clay geopolymers synthesised with bamboo wood ash as an activator**
Mary B. Ogundiran, University of Ibadan, Nigeria
23. **Analcime geopolymers as sorbents in water treatment**
Hanna Runtti, University of Oulu, Finland
24. **Adsorption of copper and zinc with alkali-activated blast furnace slag from mine water**
Johanna Kutuniva, University of Oulu, Finland
25. **Zeolite-based ceramic components through hydrothermal dry synthesis**
Alberto Conte, University of Padova, Italy
26. **3D printed geopolymeric lattices: Effect of different filler materials on mechanical properties**
Paolo Scanferla, University of Padova, Italy
27. **Electrochemical characterisation of cement hydration and properties by alternating current impedance spectroscopy**
Aldo Fernando Sosa Gallardo, [John Provis](#), University of Sheffield, United Kingdom
28. **Effect of calcination method and clay purity on the performance of metakaolin-based geopolymers**
Daniel Geddes, University of Sheffield, United Kingdom
29. **Mechanical performance of alkali activated mixtures based on electric arc furnace slag**
Nuno Cristelo, University of Trás-os-Montes e Alto Douro, Portugal
30. **Potential of IGCC slag as an alkali activated material**
Byoungkwan Kim, UST, South Korea
31. **Benefits of adding calcium hydroxide to metakaolin-based geopolymers on fast setting and strength enhancement**
Byoungkwan Kim, UST, South Korea

32. **Geopolymer ultrahigh performance concrete: Material and performance**
Weiliang Gong, Catholic University of America, USA
33. **Geopolymer waste forms for radioactive wastes**
Weiliang Gong, Catholic University of America, USA
34. **Freezing and thawing resistance of slag alkali activated concrete with different activators**
Vlastimil Bilek, ZPSV a.s., VSB TU Ostrava, Czech Republic
35. **Geopolymer matrix for the inertization of gold mine tailings**
Isabella Lancellotti, University of Modena and Reggio Emilia, Italy
36. **Geopolymer materials based on different aluminosilicate sources**
Sylvie Rossignol, CEC IRCER, France
37. **Durability of lightweight geopolymers for passive fire protection: steel corrosion behavior in chloride-rich environment**
Giulia Masi, University of Bologna, Italy
38. **Amorphous, Self-Healed (ASH-G) geopolymer and (ASH-C) ceramic composites**
Patrick Keane, University of Illinois at Urbana-Champaign, USA
39. **The use of waste bricks and tiles as a precursor for alkali activated binders**
Mark Whittaker, Queen's University Belfast, United Kingdom
40. **Mechanical and fracture performance of cellulose fibers based geopolymeric composite incorporating wastes**
Gianmarco Taveri, Institute of Physics of Materials (IPM), Czech Republic