

# International Conference on Calcium Aluminates

Cambridge, 26-28 July 2021

This is a list of the provisional titles for which manuscripts have been received and these are at various stages of peer review and completion. The majority are complete and they have been grouped by topic, although this is not necessarily the order in which the papers will be presented at the Conference or indeed the Proceedings. We have taken the opportunity of the COVID19 related postponements to accept one or two additional manuscripts but they are not yet included on this list but will be added once the manuscripts have been received and formally accepted. Equally we hope that the authors listed will all be able to attend the conference, but we understand that this may not be possible in all cases.

## PART ONE – CALCIUM ALUMINATE TYPES AND MANUFACTURE

### **Characterization of different types of Bauxite, their effect on calcium aluminate cement phase quantity and investigation of refractory properties**

*Metehan SEVEROĞLU and Berrak AVCIOĞLU*

Çimsa Cement Research and Application Center, Turkey

### **Investigation of the effect of fuel types on Gehlenite and Mayenite phases and performance of Calcium Aluminate Cements**

*Metehan SEVEROĞLU and Berrak AVCIOĞLU*

Çimsa Cement Research and Application Center, Turkey

### **Investigation of the relationship between mineralogical content and rapid hardening property of calcium aluminate cement**

*Murat AYDIN, Metehan SEVEROĞLU and Suphi URAL*

Çimsa Cement Research and Application Center, Turkey; Mining Engineering Department, Engineering Faculty, Cukurova University, Adana 01330, Turkey

### **CO<sub>2</sub>-reduced sulfoaluminate cements using Belterra clay: An abundant bauxite overburden in Brazilian Amazon to produce eco-friendly binders - Abstract**

*Leonardo BOIADEIRO AYRES NEGRÃO, Herbert PÖLLMANN and Marcondes LIMA DA COSTA*

Department of Mineralogy, University of Halle/Saale, 06120 Halle, Germany; Institute of Geosciences, Federal University of Pará, Belém, Brazil

### **F<sup>-</sup> and SO<sub>4</sub><sup>-</sup> containing calcium sulfoaluminate 3CaO•3Al<sub>2</sub>O<sub>3</sub>•xCaF<sub>2</sub>•(1-x)CaSO<sub>4</sub> with 0 ≤ x ≤ 1**

*Sabrina GALLUCCIO and Herbert PÖLLMANN*

Department of Mineralogy, University of Halle/Saale, 06120 Halle, Germany

### **Synthesis of calcium rare earth aluminates**

*Chimednorov OTGONBAYAR and Herbert PÖLLMANN*

Department of Mineralogy, University of Halle/Saale, 06120 Halle, Germany

### **An investigation of the chemical distribution of minor elements in high alumina cements by a multidisciplinary approach**

*Marco CANTALUPPI, Fiorenza CELLA, Wojciech KAGAN, Nicoletta MARINONI and Fernando CÁMARA*

Earth Science Department “Ardito Desio”, University of Milan, 20133, Milan, Italy; MAPEI S.p.A., R&D Central Laboratory, Milan, Italy; Gørka Cement SP. Z. O. O., Lipcowa 58, 32540, Trezbinia, Poland

### **SYNTHESIS AND CHARACTERIZATION OF SOLID SOLUTION CAH<sub>10</sub> – SRAH<sub>10</sub>**

*Herbert PÖLLMANN*

Department of Mineralogy, University of Halle/Saale, 06120 Halle, Germany

## PART TWO – HYDRATION AND METHODS OF ANALYSIS

### **New advances in dynamic EIS (DEIS) methods for the understanding of the calcium aluminate cement hydration mechanisms**

*Dominika MADEJ*

AGH University of Science and Technology, Faculty of Materials Science and Ceramics, 30-059 Krakow, Poland

### **Hydration of CAC-based binders: Population balance equations for kinetic modelling**

*Nicolas MAACH, Jean-François GEORGIN, Judith POMMAY and Stéphane BERGER*

GEOMAS Laboratory, INSA Lyon, 69621 Villeurbanne, France; Imerys Technology Center, 38090 Vaulx-Milieu, France

### **Hydration kinetics of CA<sub>2</sub>-CA-filler mixes analysed by in-situ XRD and pore solution composition**

*Andreas KOEHLER, Juergen NEUBAUER and Friedlinde GOETZ-NEUNHOEFFER*

Friedrich-Alexander-University Erlangen-Nürnberg (FAU), GeoZentrum Nordbayern, Mineralogy, Erlangen, Germany

### **Influence of relative humidity exposure on the microstructure of hardened CAC paste**

*Sandra WAIDA, Mirco WAHAB and Thomas A. BIER*

Institute of Ceram., Glass and Construction Materials, TU Bergakademie Freiberg, 09596 Freiberg, Germany

### **Electric resistivity testing method to assess conversion in calcium aluminate cement concrete**

*Marwa M. KORAYEM, Aaron J. STRAND, Matt P. ADAMS and Anthony BENTIVEGNA*

John A. Reif, Jr. Department of Civil and Environmental Engineering, New Jersey Institute of Technology, Newark, NJ, USA; Jensen Hughes, Baltimore, MD, USA

### **Decoupling the effect of hydrate mineralogy and porosity resulting from conversion on calcium aluminate cement corrosion resistance**

*W. LIU, A. W. H. CHEUNG and Margorie VALIX*

The University of Sydney, Sydney, NSW, Australia

## PART THREE – USES AS ACCELERATORS FOR PORTLAND CEMENTS

### **Ettringite accelerator in Portland cement dominated systems: A comparison of different calcium aluminate technologies**

*Stéphane BERGER, D. TOURLAKIS and Sébastien PERROT*

Imerys Technology Center, 38090 Vaulx-Milieu, France

### **Amorphous flash calcined alumina, effect on shrinkage and set of Portland cement**

*Ludo C. VAN NES BLESSING*

CALTRA Nederland BV., 3640 AH Mijdrecht, The Netherlands.

## PART FOUR – ADMIXTURES FOR CAC

### **Effect of Li<sub>2</sub>CO<sub>3</sub> on early hydration of CA-cement mixed with CaCO<sub>3</sub>: Hydrate and liquid phase analysis**

*Tanja MANNINGER and Friedlinde GOETZ-NEUNHOEFFER*

Friedrich-Alexander-University Erlangen-Nürnberg (FAU), GeoZentrum Nordbayern, Mineralogy, Erlangen, Germany

### **Accelerating calcium aluminate cements with lithium salt: New insights on the hydration mechanism and on the properties**

*Camille NALET, Nicolas MAACH, Eric CHARPENTIER, Stéphane BERGER and Hervé FRYDA*

Imerys Technology Center, 38090 Vaulx-Milieu, France

### **Specific biopolymers as accelerator for alumina cement**

*Alexander ENGBERT and Johann PLANK*

Chair for Construction Chemistry, Technische Universität München, 85747 Garching, Germany

### **Hydration control of CAC using alkali carboxylic compounds**

*Herbert PÖLLMANN*

Department of Mineralogy, University of Halle/Saale, 06120 Halle, Germany

## PART FIVE – HYDRATION AND DURABILITY OF BINARY SYSTEMS

### **The effect of temperature on the formation of the structure of hydrated calcium aluminate cement with microsilica**

*Valentin ANTONOVIĆ, Renata BORIS, Rimvydas STONYS and Jurgita MALAIŠLIENĖ*

Laboratory of Composite Materials, Institute of Building Materials, Vilnius Gediminas Technical University, Vilnius 08217, Lithuania

### **The effect of calcium nitrate and silica fume on properties of calcium aluminate cement**

*H. X. WANG, Gui-zhi DIAO, G. H. LIU and Danielle M. VAN NES*

China Building Materials Academy, Beijing 100024, China; State Key Laboratory of Green Building Materials, China; Kaifeng Qiming Refractory Materials Co. Ltd. China; Caltra Nederland B.V. Netherlands

### **Long-term durability of calcium aluminate cement concrete in Japan**

*Daiki SHIMAZAKI, Taiichiro MORI, Yukio SASAGAWA and Etsuo SAKAI*

Denka Co., Ltd. Omi Plant, Cement & Special Cement Additives Research Dept., Niigata 949-0393, Japan; Denka Co., Ltd. Head Office, Production & Process Technology Dept., Tokyo 103-8338, Japan; Tokyo Institute of Technology, School of Materials and Chemical Technology, Department of Materials Science and Engineering, Tokyo 152-8552, Japan

### **Aggregate impacts on chemistry, conversion, and strength in calcium aluminate cement concrete systems**

*Matt P. ADAMS, Marwa M. KORAYEM and Jason H. IDEKER*

John A. Reif, Jr. Department of Civil and Environmental Engineering, New Jersey Institute of Technology, Newark, NJ, USA; School of Civil and Construction Engineering, Oregon State University, Corvallis, OR, USA

### **Impacts of conversion on drying shrinkage of calcium aluminate cement using finely ground limestone**

*Marwa M. KORAYEM and Matt P. ADAMS*

John A. Reif, Jr. Department of Civil and Environmental Engineering, New Jersey Institute of Technology, Newark, NJ, USA

### **Time-resolved investigation of the early hydration of calcium aluminate cement in the presence of calcite**

*Julian GOERGENS, Tanja MANNINGER and Friedlinde GOETZ-NEUNHOEFFER*

Friedrich-Alexander-University Erlangen-Nürnberg (FAU), GeoZentrum Nordbayern, Mineralogy, Erlangen, Germany

## PART SIX – TERNARY BINDERS

### **Influence of sulphate source on hydration and phase formation in ternary binders**

*Elsa QOKU and Thomas A. BIER*

Institute of Ceram., Glass and Construction Materials, TU Bergakademie Freiberg, 09596 Freiberg, Germany

### **Impact of calcium sulfate combination on performance and phase evolution in self-levelling compound**

*Ingrid MIKANOVIC, Ronnie KADEN, Arno REIL, Markus SCHMID, Gunther WALENTA and Dubravka MARETIC*

CALUCEM GmbH, 68219 Mannheim, Germany; CALUCEM d.o.o, 52100 Pula, Croatia

### **Towards understanding the ageing behaviour of SLU formulations: Impact of pre-hydration on individual components and the role of admixtures**

*Florian A. HARTMANN, Alexander ENGBERT and Johann PLANK*

Chair for Construction Chemistry, Technische Universität München, 85747 Garching, Germany

### **Investigation of CAC - PC - C<sub>S</sub> in a ternary system and determination of ratio of CAC cement to PC**

*A. B. ÖZTÜRK, Ayten ÇAPUTÇU, Metehan SEVEROĞLU and Berrak AVCIOĞLU*

Çimsa Cement Plant- Çimsa Research and Application Center, Turkey; Çimsa Cement Plant- Çimsa Cement Research and Application Center, Turkey

### **Dimensional stability of CSA-based binders for flow-applied screeds**

*Federica BERTOLLA, Livio Capelli and Fulvio CANONICO*

Buzzi Unicem, 13039 Casale Monferrato, Italy

## PART SEVEN – FURTHER ETTRINGITE SYSTEMS

### **Influence of calcined clay on the hydration of ternary binders based on calcium aluminate cement, calcium sulfate and Portland cement**

*Sarra EL HOUSSEINI, Karen SCRIVENER and Barbara LOTHENBACH*

Laboratory of Construction Materials, Ecole Polytechnique Fédérale de Lausanne, 1015 Lausanne, Switzerland;  
Laboratory Concrete/Construction Chemistry Empa, Uberlandstr.129, CH-8600 Dubendorf, Switzerland

### **Quantification of phase compositions of complex mixtures of CAC with PC, anhydrite and metakaolinite**

*Herbert PÖLLMANN and Sabrina GALLUCCIO*

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### **Stability of ettringite in blended systems with CAC-PC-CŠ**

*Jason A. IDEKER, Anika T. SARKAR, J. A. SMITH and Lamiya NOOR*

School of Civil & Construction Engineering, Oregon State University, Corvallis, Oregon 97331, USA; Department of Civil and Environmental Engineering University of Tennessee, Knoxville, TN 37996, USA

### **Performance of rapid-repair (ettringite-based) concrete in a harsh marine environment**

*Edward (Ted) G. MOFFATT, Mike D. A. THOMAS, Racheal LUTE, Thanos DRIMALAS and Kevin FOLLIARD*

Royal Military College of Canada, Kingston, Ontario, Canada; University of New Brunswick, Fredericton, New Brunswick, Canada; Katerra, Austin, Texas, USA; University of Texas at Austin, Austin, Texas, USA

## PART EIGHT – WIDE RANGING APPLICATIONS

### **Blended calcium aluminate cements for digital fabrication with concrete**

*Arnesh DAS, Lex REITER, Sara Mantellato and Robert FLATT*

Institute of Building Materials, ETH Zurich, Switzerland

### **Calcium aluminate cement composites to improve CO<sub>2</sub> injection well integrity**

*Krunoslav SEDIC, Neven UKRAINCYK, Vilko MANDIC and Nediljka GAURINA-MEDIMUREC*

Crosco, Integrated Drilling & Well Services Co., Ltd., 10 313 Graberje Ivaničko, Croatia; Technische Universität Darmstadt, Institut für Werkstoffe im Bauwesen, 64 287 Darmstadt, Germany; University of Zagreb, Faculty of Chemical Engineering and Technology, 10 000 Zagreb, Croatia; University of Zagreb, Faculty of Mining, Geology and Petroleum Engineering, 10 000 Zagreb, Croatia

### **Applicability of ternary blended calcium aluminate cement-based mortar in deep sea conditions**

*Keisuke TAKAHASHI, Mari KOBAYASHI and Yuichiro KAWABATA*

Ube Industries, Ltd., Okinoyama 1-6 Ube 7558633, Japan; Port and Airport Research Institute, Nagase 3-1-1 Yokosuka 2390826, Japan

### **Setting shrinkage measurements during cement hydration**

*Stefan KUIPER, Geert WAMS, Alexandra SPIES, Dagmar SCHMIDTMEIER, Sebastian KLAUS, Andus BUHR and Jerry DUTTON*

Almatis B. V., Rotterdam, The Netherlands; Almatis GmbH, Frankfurt/Ludwigshafen, Germany

### **Mineral interactions of CAC in refractory castables during thermal treatment**

*Alexandra GERZ, Markus SCHMID and Gunther WALENTA*

CALUCEM GmbH, 68219 Mannheim, Germany

### **Research on properties of cost-effective structural heat resistant concrete using CAC and EAF slag aggregates**

*Ahmad EMAMI ALORAIZI and M. J. REZAEI ABADI*

Iran refractory cements, Esfahan, Iran; Najaf Abad Azad University; Mobarakeh Steel Structural Laboratory, Iran

## **PART NINE – DURABILITY IN BIOGENIC CONDITIONS**

### **Towards a better understanding of biodegradation mechanisms of calcium aluminate based materials in sewer conditions**

*Amr ABOULELA, Cédric PATAPY, Alexandra BERTRON, Amaury BUVIGNIER and Matthieu PEYRE LAVIGNE*

LMDC, Université de Toulouse, UPS, INSA, Toulouse, France ; TBI, Université de Toulouse, CNRS, INRA, INSA, Toulouse, France

### **CAC-based binder for microbiologically induced corrosion resistant concretes and mortars**

*Markus SCHMID, Gunther WALENTA, Danilo PASSALAQUA, Francesco SURICO, Fiorenza CELLA and Davide SALVIONI*

CALUCEM GmbH, 68219 Mannheim, Germany; MAPEI S.p.A., 20158 Milano, Italy

### **Microbiologically induced corrosion resistant concrete for sewer networks**

*Markus SCHMID, Alexandra GERZ, Ingrid MIKANOVIC and Gunther WALENTA*

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### **Comparison of converted and unconverted CAC pastes, reactivity in sewer environment using transport-reaction modelling**

*Matthieu PEYRE LAVIGNE, Amaury BUVIGNIER, Cédric PATAPY, Etienne PAUL and Alexandra BERTRON*

TBI, Université de Toulouse, CNRS, INRA, INSA, Toulouse, France; LMDC, Université de Toulouse, UPS, INSA, Toulouse, France

### **Microbial activity in calcium aluminate based materials**

*Eva KRÄNZLEIN, Paul BRUMM, Thomas BIER, N. SHAHEEN and Syed Ali RIZWAN*

Institute of Ceramic, Glass and Construction Materials, TU Bergakademie Freiberg, 09599 Freiberg, Germany; NUST, Islamabad, Pakistan

### **Comparative acid resistance of one-part geopolymers and calcium aluminate cement mortar**

*Cherdphong SEEDAO, M. E. FISHER and Marjorie VALIX*

The University of Sydney, NSW 2006, Australia

### **Degradation of mortar in acetic acid: Calcium aluminate versus Portland cement**

*Neven UKRAINCZYK, Eduardus KOENDERS, Cyrill GRENGG and Martin DIETZEL*

Technische Universität Darmstadt, Institut für Werkstoffe im Bauwesen, 64 287 Darmstadt, Germany; Graz University of Technology, Institute of Applied Geosciences, 8010 Graz, Austria

### **Characterisation of a 60-year old cementitious lining on a concrete sewer pipe removed from Mahatma Gandhi road sewer network in Durban, South Africa**

*Moses W. KILISWA*

Department of Civil Engineering, University of KwaZulu-Natal, 4041, South Africa

**PART TEN – PROVISIONAL TITLES**

**Calorimetry studies on blending of calcium aluminate cement with ground granulated blast-furnace slag**

*Yun BAI, Shaoyan LI and Raman MANGABHAI*

University College London, London, UK; Mangabhai Consulting, UK

**A review on the effects of adding other materials on the properties of calcium aluminate cement**

*Salim A. BARBHUIYA, A. ALI and Ayub ELAHI*

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**Early-age hydration of anhydrous calcium aluminate phases on suspension**

*Birsen C. BUDAN, Jean-Baptiste CHAMPENOIS, Céline CAU DIT COUMES, Jean-Baptiste D'ESPINOSE DE LACAILLERIE*

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**the effect of chemical admixtures on the hydration of binary systems of CAC and calcium sulfate**

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