International Conference on Calcium Aluminates

Cambridge, 18-20 July 2022

This is a list of titles for which manuscripts have been received, peer reviewed and will appear in the Proceedings and grouped as listed by topic. These are not necessarily the order in which the papers will be presented at the Conference. We are expecting further contribution which will be presented at the conference, either as oral presentations or posters.

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

F^- and SO_4^- containing calcium sulfoaluminate $3CaO•3Al_2O_3•xCaF_2•(1-x)CaSO_4$ with $0 \leq x \leq 1$
Sabrina GALLUCCIO and Herbert PÖLLMANN
Department of Mineralogy, University of Halle/Saale, 06120 Halle, Germany

F^- and $SO4^-$ containing calcium sulfoaluminate

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; Gòrka Cement SP. Z. O. O., Lipcowa 58, 32540, Trezbinia, Poland

Synthesis and characterization of solid solution CAH_{10} – $SrAH_{10}$
Herbert PÖLLMANN
Department of Mineralogy, University of Halle/Saale, 06120 Halle, Germany

Ternary solid solution of CA - SrA – BaA
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-Milieux, France

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
CEA, DES, ISEC, DE2D, SEAD, LCBC, Univ Montpellier, Marcoule, France; Laboratoire de Sciences et Ingénierie de la Matière Molle, UMR CNRS 7615, ESPCI Paris, PSL Research University, 75231 Paris Cedex 05, France

Hydration kinetics of CA_2-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, Matthew 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-Milieux, 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_2CO_3 on early hydration of CA-cement mixed with $CaCO_3$: 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-Milieux, 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 ANTONOVIČ, Renata BORIS, Rimvydas STONYS and Jurgita MALAIŠLIENĖ
Laboratory of Composite Materials, Institute of Building Materials, Vilnius Gediminas Technical University, Vilnius 08217, Lithuania

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

Matthew 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 Matthew 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 prehydration 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 - CŠ 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 BERTOLA, 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
Department of Mineralogy, University of Halle/Saale, 06120 Halle, Germany

Use of high ettringite producing ternary blend systems for thermochemical energy storage

Aaron J. STRAND and Matthew P. ADAMS
John A. Reif, Jr. Department of Civil and Environmental Engineering, New Jersey Institute of Technology, Newark, NJ, USA

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_2 injection well integrity

Krunoslav SEDIĆ, Neven UKRAINCZYK, Vilko MANDIĆ and Nediljka GAURINA-MEĐIMUREC
Crosco, Integrated Drilling & Well Services Co., Ltd., 10 313 Graberje Ivanićko, 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
CALUCEM GmbH, 68219 Mannheim, Germany

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

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

Comparative acid resistance of one-part geopolymer and calcium aluminate cement mortar
Cherdphong SEEDAO, M. E. FISHER and Marjorie VALIX
The University of Sydney, NSW 2006, Australia

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