

## CALCIUM ALUMINATE CEMENT 19-21 May 2014

This is a list of provisional titles for which abstracts have been received and the authors have been asked to submit completed manuscripts for review by the end of July and as with the previous Calcium Aluminate Conferences, these manuscripts will be peer reviewed prior to acceptance for publication. Although every effort will be made to include late manuscripts it is important that they are received in good time to allow for the editing process so that the Proceedings can be given to the delegates when they arrive at the Conference. The titles are grouped provisionally according to subject matter, but the order shown is not indicative about the meeting timetable. This will be decided closer to the date of the meeting.

### CALCIUM ALUMINATES PHASES

#### **The influence of mineralogical compositions of high alumina cement on its physical – mechanical properties**

*Cristina Stancu<sup>1</sup>, Nicolae Angelescu<sup>2</sup> and Marcela Muntean<sup>3</sup>*

<sup>1</sup>National Institute for Cement research and Design, <sup>2</sup>Technical University “Valahia” Tarogoviste and <sup>3</sup>Politechnica University Bucharest, Romania

#### **Mineral composition and hydration of a C<sub>12</sub>A<sub>7</sub> rich binder**

*Bruno Touzo*

Kerneos Research Center, France

#### **Comparison of the roles of C4AF (Ferrites) in CAC and in Portland Cement**

*John Bensted*

UK

#### **Course of Hydration of Ferrite Phase in a Ternary Binder Model Mix**

*J Neubauer, D Ectors and F Goetz-Neunhoefer*

Mineralogy, GeoZentrum Nordbayern, Erlangen, Germany

#### **Phase Formation in CAC: Synthesis and Crystal Chemistry of Manganese Containing Perovskites: Ternary perovskite Ca(Fe,Mn,Ti)O<sub>3-d</sub> and Ca<sub>3</sub>(Fe,Mn,Ti)<sub>3</sub>O<sub>8-d</sub> phases**

*S. Stöber<sup>1</sup>, G Redhammer<sup>2</sup>, S Storr<sup>3</sup>, V Pomakushin<sup>4</sup>, O Prokhnenko<sup>5</sup> and Herbert Pöllmann<sup>1</sup>*

<sup>1</sup>University of Halle, <sup>2</sup>University of Salzburg, <sup>3</sup>Free University of Berlin, <sup>4</sup>Paul Scherrer Institute and <sup>5</sup>Helmholtz-Zentrum-Berlin for Materials and Energy, Germany

#### **Mono(strontium/calcium) aluminate based cements**

*Herbert Pöllmann and R Kaden*

University of Halle, Germany

#### **Synthesis and Crystal Chemistry of Strontium Aluminates**

*Herbert Pöllmann, Stefan Ströber, P. Mohr and Ronny Kaden*

University of Halle, Germany

#### **Crystal structures and XRD data of new calcium aluminate cement hydrates**

*Herbert Pöllmann, Stefan Ströber and Ronny Kaden*

University of Halle, Germany

#### **Hydraulic Phases in the System BaO-Al<sub>2</sub>O<sub>3</sub>**

*Ronny Kaden, Herbert Pöllmann*

University of Halle, Germany

## HYDRATION

### **Kinetics of Calcium Aluminate dissolution by QXRD and corresponding enthalpies of reactions**

*F. Goetz-Neunhoffer*, *S.R. Klaus* and *J. Neubauer*

Mineralogy, Geozentrum Nordbayern, Schlossgarten, Erlangen, Germany

### **Quantitative and qualitative analysis of CAC and its hydration products**

*Serina Ng*

Sintef, Trondheim, Norway

### **Thermodynamics in the system CaO-Al<sub>2</sub>O<sub>3</sub>-H<sub>2</sub>O**

*B. Lothenbach*, *L. Pelletier-Chaignat*, *F. Winnefeld*

EMPA, Swiss Federal Laboratories for Materials Science and Technology, Laboratory Concrete/Construction Chemistry, Switzerland

## HYDRATION IN CONTEXT OF REFRACTORY SYSTEMS

### **Testing of Calcium Aluminate Cement bonded concretes and influence of curing conditions on the strength development**

*D. Schmidtmeier*, *A. Buhr*, *G. Wams*, *S. Kuiper*, *S. R. Klaus*

Almatis GmbH, Almatis BV, Mineralogy and GeoZentrum Nordbayern, Netherlands, Germany

### **Application of Heat Flow calculation to synthetic Calcium Aluminate Cement mixes**

*S.R. Klaus*, *J. Neubauer*, *A. Buhr\**, *D. Schmidtmeier* and *F. Goetz-Neunhoffer*

Mineralogy, Geozentrum Nordbayern, Schlossgarten, Erlangen, Germany. \*Almatis, Netherlands

### **Hydration and properties of calcium magnesium aluminate cement**

*Auvray J.M.*, *Zetterstrom C.*, *Wohrmeyer C.*, *Kebli F.*

Kerneos Research Center, France

### **Investigation on the hydratable compounds in the CaO-Al<sub>2</sub>O<sub>3</sub>-ZrO<sub>2</sub> system**

*Dominika Madej*<sup>1</sup>, *Jacek Szczerba*<sup>1</sup>, *Wojciech Kagan*<sup>2</sup>

<sup>1</sup>AGH University of Science and Technology, Krakow, Poland and <sup>2</sup>Gorka Cement Sp, Poland

HYDRATION OF CALCIUM ALUMINATE AND CALCIUM SULFATE BLENDS

**Hydration study of a Calcium Aluminate Cement blended with anhydrite**

*Gwenn Le Saout, B Lothenbach, P Taquet, H Fryda and F Winnefeld*

EMPA Swiss Federal Laboratory for Materials Science and Technology, Concrete and Construction Chemistry Laboratory, Switzerland. Kerneos Research & Technical Center and Ecole des Mines d'Alès, France

**Impact of different calcium sulphate sources on early age hydration of two different grades of Calcium Aluminate Cement**

*C Stabler<sup>1</sup>, C Breunig<sup>1</sup>, F Goetz-Neunhoeffler<sup>1</sup>, J Neubauer<sup>1</sup>, H Frieda<sup>2</sup> and R Kwasny-Echterhagen<sup>2</sup>*

<sup>1</sup>University of Erlangen, Germany. <sup>2</sup>Kerneos Research Center, France

**Impact of calcium sulphate type on hydration and properties of ettringite systems**

*Berger Stéphane., Gauthier D, Bordet F., Fryda H.*

Kerneos Research Center, France

**Influence of sulfates on the physical properties of quick-hardening cement with added amorphous calcium aluminate and anhydrite**

*H Hara, T Higuchi, M Morioka, T Hurnaus, J Plank and Etsuo Sakai.*

Denki Kagaku Kogyo, Japan. Technical University Munich, Germany. Tokyo Institute of Technology, Japan

**Expansion mechanisms in ettringite systems**

*Julien Bizzozero and Karen Scrivener*

École Polytechnique Fédérale de Lausanne (EPFL), Switzerland

HYDRATION OF THE TERNARY SYSTEM CAC – C $\check{S}$  - PC

**Long-term Hydration and Mechanical Behaviour of Portland Cement, Calcium aluminate Cement and Calcium Sulfate Blends**

*David Torrens-Martin, Lucia Fernández*

Universitat Politècnica de Catalunya, Spain

**Valorization of gypsum construction wastes on ternary systems**

*Lucia Fernández, L M Morales, D Torrens-Martin*

Universitat Politècnica de Catalunya, Spain

**Hydration of calcium aluminate cement based systems with calcium sulfates and supplementary cementitious materials**

*Julien Bizzozero and Karen Scrivener*

École Polytechnique Fédérale de Lausanne (EPFL), Switzerland

**Ultra fast setting / High Early Strength Cement - comparison of blends of different types of Calcium aluminate Cements, Calcium Sulphate and Portland Cement - a Ternary system**

*Ludo van Nes Blessing and Paul Bilars*

Inorganic Research Centre, Caltra Nederland BV, 3641 SG Mijdrecht, The Netherlands

**Temperature Dependence on length change of cementitious material using Portland Cement – Calcium Aluminate Cement-Anhydrite – Blast Furnace Slag System.**

*H Mori, E Maruya, A Sasaki and T Takahahi*

Ube Industries LTD, Japan

**Hydration and microstructure of rapid-strength binders based on Portland cement accelerated by early ettringite formation**

*Julien Bizzozero and Karen Scrivener*

École Polytechnique Fédérale de Lausanne (EPFL), Switzerland

TESTING THE PROPERTIES OF CAC'S

**Some Insight in the Flow Ability of Calcium Alumina Cement Powders**

*Labourt Ibarre P., Larnaudie E*

Kerneos Research Center, France

**Hydraulic Behaviour and the early strength development of the mortars containing granulometrically and chemically modified HAC binders**

*Wojciech. Kagan*

Gorkal, Poland

**Accelerated Test Method for Determining the Converted Strength of Calcium Aluminate Cement Concrete**

*Matthew P. Adams, Travis Moore, Jason H. Ideker*

Oregon State University, Oregon USA

**Influence of Pozzolanic Material in the conversion and corrosion behaviour of Calcium Aluminate Cement**

*J Sio<sup>1</sup>, D Vitanage<sup>2</sup>, H Bustamante<sup>2</sup>, J De Grazia<sup>3</sup>, T Kuen<sup>3</sup>, J Nazimek<sup>4</sup>, T Evans<sup>4</sup> and Marjorie Valix<sup>1</sup>*

<sup>1</sup>University of Sydney, <sup>2</sup>The Sydney Water Corporation, <sup>3</sup>Melbourne Water and <sup>4</sup>Water Corporation – Perth, Australia

**The influence of water to powder ratio to the resistance for sulfuric acid of hardened calcium aluminate cement containing blast furnace slag**

*Tomoaki Sugiyama, Kazuto Tabara, Minoru Morioka and Etsuo Sakai*

Central Research Institute of Electric Power Industry, Denki Kagaku Kogyo Kabushiki Kaisya and Tokyo Institute of Technology, Japan

ADMIXTURES

**Reaction of Alkaline Earth Glycolates and their Application as CAC admixtures**

*Ronny Kaden and Herbert Pöllmann*

University of Halle, Germany

**Formation of Organo-Mineral phases in Calcium Aluminate Cement involving polycarboxylate Superplasticizers**

*J A Plank and S. Ng*

Technical University Munich, Germany

**Polycarboxilate ether based superplasticizer for Calcium Aluminate Cement Mortars**

*Neven Ukrainczyk, Nevenka Vrbos, Juraj Sipusic*

University of Zagreb, Croatia

**A new setting accelerator using Lithium Sulfate technology for Calcium Aluminates based materials**

*Estival J., Jamel Mahiaoui ., Watt V*

Kerneos Research Center, France

**Action mechanism of retarder in ettringite system**

*Judith Pommay., Fryda H., Mahiaoui J., Bordet F*

Kerneos Research Center, France

## DURABILITY

### **Preliminary results of durability study of Building Chemistry materials**

*Estival J., Brigandat P., Taquet P*

Kerneos Research Center, France

### **Behaviour of Carbonation resistance of Phosphate modified Calcium Aluminate Cement pastes**

*Li Shiqun and Hu Jiashan*

School of Material Science and Engineering, University of Jinan 250022, China

### **The Performance of CAC Concrete in Chloride Environments**

*Huang Yi and M.D.A Thomas*

University of New Brunswick, Canada

### **Durability of Rapid-Strength Concrete Produced with Ettringite-Based Cements**

*Ted Moffatt and Michael Thomas*

University of New Brunswick, Canada

### **Mineralogy of a 90-year old structure: "Le tunnel des Valois"**

*Francois Sorrentino*

France

## SEWERAGE APPLICATIONS

### **Use of Calcium Aluminate Cements in South African Sewers**

*Alaster Goynes*

Pipeline installation and Professional Engineering Services cc, South Africa

### **Performance of various cements in an experimental sewer that has been monitored for over 20 years**

*Alaster Goynes<sup>1</sup> and Mark Alexander<sup>2</sup>*

<sup>1</sup>Pipeline installation and Professional Engineering Services cc, <sup>2</sup>University of Cape Town, South Africa

### **Acid resistance of Calcium Aluminate Cement Concrete blended with supplementary cementitious material for application in sewer pipes**

*N Motsieloa<sup>1</sup>, M G Alexander<sup>2</sup> and H Beushausen<sup>2</sup>*

<sup>1</sup>Element Consulting Engineers SA and <sup>2</sup>University of Cape Town, South Africa

### **Biogenic corrosion mechanism: study of parameters explaining calcium aluminate cement higher durability**

*Jean Herisson<sup>1,2</sup>, Eric D. van Hullebusch<sup>3</sup>, Marielle Gueguen-Minerbe<sup>1</sup> and Thierry Chaussadent<sup>1</sup>*

<sup>1</sup>IFSTTAR, <sup>2</sup>Kerneos and <sup>3</sup>UPEMLV, France

### **New method for evaluation of cement-based material resistance against biogenic attack in sewer-like environment: comparison between CAC and BFSC linings**

*Matthieu Peyre Lavigne, Alexandra Berton, Arnaud Cockx, Jean-Noel Foussard, Gilles Escadeillas and Etienne Paul*

University of Toulouse, France

## TESTING BIOGENIC ATTACK

### **Development of a reproducible, representative and accelerated biogenic corrosion test to reach sustainable structures in sewer networks**

*Jean Herisson<sup>1,2</sup>, Marielle Gueguen-Minerbe<sup>1</sup>, Eric D. van Hullebusch<sup>3</sup>, and Thierry Chaussadent<sup>1</sup>*  
<sup>1</sup>IFSTTAR, <sup>2</sup>Kerneos and <sup>3</sup>UPEMLV, France

### **Development of an accelerated test of fungal biodeterioration. Application to Calcium Aluminate Cements**

*A Govin, I Albuquerque and P Grosseau*

Ecole Nationale Supérieure des Mines de Saint Etienne, France

### **Durability of Concrete Subjected to Sulfuric Acid Attack**

*M Hajj Chehade, L Caselli, F Jacquemot and F Rougeau*

CERIB: Study and Research Centre for the French Concrete Industry, France

### **Calcium Aluminate Cement for Waste Water Sulfate Removal**

*Markus Schmid, M Schneider, D Maretic, S Maier*

Calucem GmbH, Germany

## DRYMIX MORTAR APPLICATIONS

### **Self Levelling Underlayment in the CAC rich part of the CAC-OPC-sulfate System**

*S Maier, D Maretic, Markus Schmid*

Calucem, Germany

### **Hydration and microstructure properties of Self Levelling Underlayment in drying condition: A comparison between CAC rich and OPC rich materials**

*Ambroise J.<sup>1</sup>, Le Bihan T.<sup>1</sup>, Georjgin JF.<sup>1</sup>, Andreani PA.<sup>2</sup>, xxx<sup>2</sup>*

<sup>1</sup>INSA and <sup>2</sup>Kerneos Research Center, France

### **Early-Age Volume Stability of Blended Calcium Aluminate Cement - Portland Cement - Calcium Sulfate Systems**

*Matthew P. Adams, Tengfei Fu, Jason H. Ideker*

Oregon State University, Oregon USA

### **Ageing behaviour of SLU mortar formulations based on a ternary binder system comprising OPC/CAC/Anhydrite exposed to Environmental Moisture and CO<sub>2</sub>**

*J A Plank, E Dubina and M Meier*

Technical University Munich, Germany

### **Ageing of cement and drymix : consequences and solutions**

*Carl Zetterstrom., Fryda H., Mahiaoui J., Wohrmeyer C., Benyahia K., Charpentier E*

Kerneos Research Center, France

**DIVERSE APPLICATIONS**

**Bond strength of new calcium aluminate cement to root dentin**

*Fernanda de Carvalho Panzeri Pires-de-Souza, Lucas da Fonseca Roberti Garcia, Renata Costas de Moraes and Rafaella Tonani*

Ribeirao Preto School of Dentistry - University of Sao Paulo, Brazil

**Latex-modified Calcium Aluminate Cement**

*Anthony F Bentivegna<sup>1</sup>, Jason H Ideker<sup>2</sup> and Kevin J Folliard<sup>3</sup>*

<sup>1</sup> CTL Group, <sup>2</sup> Oregon State University, Oregon and <sup>3</sup>The University of Texas at Austin, Texas USA

**Effects of mortar chemical composition on algal biofouling**

*E Dalod<sup>1,2</sup>, A Govin<sup>1</sup>, P Grosseau<sup>1</sup>, R Guyonnet<sup>1</sup>, C Lors<sup>2,3</sup> and D Damidot<sup>2,3</sup>*

<sup>1</sup>Ecole Nationale Supérieure des Mines de Saint Etienne, <sup>2</sup>Ecole Nationale Supérieure des Mines de Douai, <sup>3</sup>Université Lille Nord de France, France

**Ultra rapid hydration opening new application fields : A comparison of different Calcium Aluminate Technologies**

*Jacques Estival, Herve Fryda, Berger S, Martinet A., Bordet F., Brigandat P*

Kerneos Research Center, France

**Long Term results for CAC grouts and concretes installed on railway applications**

*Francis Orr Adams*

*Applied Concrete Systems Ltd, UK*

