ELSEVIER

Cement & Concrete Composites 26 (2004) 909–910

Cement & Concrete Composites

www.elsevier.com/locate/cemconcomp

Conference report

# Report on 23rd Cement and Concrete Science Meeting, University of Leeds, 8–9 September 2003

Charles Fentiman [a,*], Raman Mangabhai [b,1]

[a] Fentiman Consulting, Southwater, West Sussex, RH13 9GG, UK

[b] Centre for Contaminated Land Remediation, Natural Resources Institute, University of Greenwich, Pembroke, Chatham Maritime, ME4 4TB, UK

This annual two-day meeting of the Cement & Concrete Group of the Institute of Materials, Minerals and Mining has the stated aim to encourage the presentation of results of current research projects as well as the findings of completed work and authors can expect to benefit from stimulating contributions during the discussion sessions. It is also a forum where young researchers can make their first conference presentations, either orally or as a poster and there is normally a prize for the best student presentation.

The meeting attracted 82 delegates of which 23 delegates were from Australia, Cameron, North Korea, Europe, USA and Mexico.

The venue for the meeting varies between a number of academic centres with ongoing cement and concrete research, generally alternating between the North and South of the UK. A further aspect of the format of the meeting is that authors generally contribute an extended abstract of their work, usually to the standard of a short paper and the book of abstracts is included in the registration pack.

Along with the whole Cement & Concrete Community the organisers of the meeting were saddened by the loss of Professor H.F.W. Taylor, in 2002 who had been a great supporter of the past meetings, so the organising committee decided to mark his contribution with a commemorative lecture by an invited speaker who had carried out meritorious work related to the understanding of the phases present in cement. This will not necessarily be an annual event but the organisers will extend an invitation to deliver a Hal Taylor memorial lecture whenever an appropriate speaker is available and will cover the costs of accommodation, travel and registration.

The Hal Taylor memorial lecture this year was presented by Dr. Elena Bonaccorsi of University of Pisa, Italy and describing her work with Professor Stefano Merlino to unravel the structure of 1.4 nm tobermorite. Her account of this work thoroughly impressed the audience and drew very warm comment from Dr. Ian Richardson the Session Chairman.

In total 27 papers were presented orally and a further 9 as posters. As usual the sessions were themed with the first two sessions on the hydration of cement, limes and blended systems, including a thought provoking paper by John Bensted exploding some myths in cement science by experiment. This became something of a theme during the meeting with several speakers identifying additional myths that exist. Other papers in these sessions included contributions by Prof. Harald Justnes, Dr. Catherine Love, Heather Dyson, Hedda Vikan on blended systems and by Quanyuan Chen on the hydration and carbonation of tricalcium silicate in the presence of heavy metals.

In addition to the Hal Taylor memorial lecture there were a further three excellent papers dealing with various studies of hydrates by Dr. Eric Lachowski on TEM study of OPC and Geopolymers pastes with fly ash, Prof. Fred Glasser on the applied thermodynamics and cement science of Thaumasite and Dr. Gunter Beuchle on a XRD and MAS NMR investigation of the structure and thermal behaviour of synthetic tobermorite.

Interestingly a number of paper dealt with Geopolymers and this became one of the key elements of the meeting with sufficient for a whole session on this interesting topic. This session also included a presentation by Dr. Leon Black from Germany on the characterisation of CSH systems by X-ray photoelectron spectroscopy. Dr. Grant Lukey from Australia, presented an ESEM study of the geopolymerisation of slag, flyash and metakaolin, and followed this with a further presentation on the effects of gypsum additions on the geopolymerisation of metakaolinite and Dr. Ana Fenandez-Jiminez from Spain presented on some

* Corresponding author. Tel.: +44-1403-732186.

*E-mail addresses:* charles_fentiman@hotmail.com (C. Fentiman), r.j.mangabhai@btinternet.com (R. Mangabhai).

[1] Tel./fax: +44-208-9083762.

doi:10.1016/j.cemconcomp.2004.02.024

microstructural aspects of flyash based cementitious geopolymers. This session attracted much discussion and would probably merit a meeting on this subject alone. Nevertheless for a number of delegates this session was sufficient to finally give them a much-needed basic understanding of geopolymers, their strengths and weaknesses and how their use may develop.

The second day of the meeting started with a session on the stabilization of wastes and the performance of waste forms. The treatment of wastes has become quite a theme in recent years with a variety of waste types and remedial treatments ranging from remediation of contaminated soils to treating wastes so that they can be used safely as a raw material in another process. Dr. David Johnson of LafargeEnvriocem presented work on the stabilization of water treatment sludge whilst Xiaomin Li on making aggregates from wastes by stabilizing them with a $CO_2$ treatment. Dr. Neil Milestone (now at Sheffield) dealt with the stabilization of roads in New Zealand, by using a new type of slag from steel production and Dr. Andrew Dunster and co-workers at the BRE on the use of slag from zinc production as bound aggregate in concrete.

Durability and leaching are perpetual themes at these meetings, and this year was no exception with five papers on different aspect. Dr. Andy Harris of UK Nirex, Jan Beddows of the University of Warwick and Dr. Ana Hildago of ICC, Spain presented respectively on the testing of models of the dissolution of cement, the prediction service lives of glass fibre reinforced concretes and leaching effects in cement pastes. George Collett of BRE presented work on Thaumasite form of sulfate attack. A further dimension to this session was added by, Dr. Neil Milestone, presenting on the interaction of cellulose fibres and autoclaved cement matrix. This is an important area for companies involved in making fibre cement boards that would previously have contained asbestos.

Inevitably the final session dealt with a number of interesting topics that defied categorising into the chosen themes. These included; Lauren Gomez-Zamorano from the Centro de Investigacion de Estudios Avanzados de IPN in Mexico, discussing the use in concrete of amorphous silica produced as a bi-product of energy generation from geothermal resources, Dr. Phil Purnell discussing the use of advanced ultrasonics for non-destructive testing, Prof. John Bensted on oil well cement compositions for better long term durability and John Harrison from Australia on a novel cement based on the use of magnesium hydroxide.

In addition to the oral presentations there were nine excellent posters, the majority presenting some early results of recently started projects. Two poster from Research Centre Karlsruhe, Germany, dealt with Incorporation of Zinc into C–S–H phases with CaO/$SiO_2 < 1$ by A Stumm et al. and new structural model for foshagite $Ca_4Si_3O_9(OH)_2$: refinement with rietveld method by Garbev et al. Three poster from Immobilisation Science Laboratory, University of Sheffield, UK: Encapsulation of iron hydroxide flocs in composite cement, Collier et al.; corrosion of metals in composite cements, Setiadi et al. and the effect of simulated barium carbonate waste stream on the hydration of composite cement systems, Utton et al. Concrete constitutive model for high temperature and multi-axial loading by Tenchev et al. of Warwick University. Further four posters from University of Leeds which dealt with supercritically carbonated cement composites with controlled pore solution chemistry, Shaw et al.; effects of metakaolin and interfacial transition zone on the diffusion of chloride ions through cement paste, Ashbridge et al. and sacrifical anodes for use in reinforced concrete by Jordan et al.; analysis of transition zones between steel reinforcing bar and concrete, Horne et al.

A student prize for best paper or poster was voted by the delegates and presented to Lauren Gomez-Zamorano; she received a statue of prophet Sam from Dr. Ian Richardson of University of Leeds.

At the end of the meeting the organisers were gratified by several very favourable comments received from the delegates, one of whom had attended similar meetings in the USA, South Africa and Scotland and had considered this meeting to be the most useful.

There was a lively discussion during each of the sessions and informally. It was worth the conference fee just to see world leading cement chemists Professors Chris Page, Fred Glasser, John Sharp, John Bensted and Harald Justnes who stimulated discussion and guided researches into the mystery of cement and concrete science.

Cement and Concrete Science would like to thank Professor C.L. Page for the use of facilities at University of Leeds and Dr. A.R. Brough for acting as the local organizer for the event.

The 24th Cement and Concrete Science will be held at The University of Warwick, Coventry, UK, 16–17th September 2004. Deadline for the abstract is 30th May 2004 and this should be submitted to R.J. Mangabhai.

If you would like a book of extended abstracts or if you have any questions about Cement and Concrete Science, please contact:

Charles Fentiman, B.Sc. Ph.D., CEng FIMMM. Tel.: +44-1403-732186 or charles_fentiman@hotmail.com.

or

Raman Mangabhai, B.Sc. (Hons), CChem, MRSC, AMICT. Tel./fax: +44-208-9083762 or r.j.mangabhai@btinternet.com.