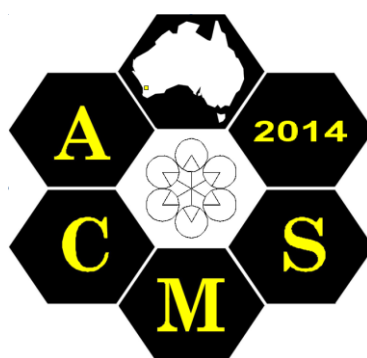


Australian Clay Minerals Society Inc.
in conjunction with the
Petroleum Exploration Society of Australia

Australian Clay Minerals Society 23rd Conference

PROCEEDINGS

Editor: R.J. Gilkes



23rd ACMS Conference

Trinity College,

The University of Western Australia

Perth, WA

3rd - 5th February 2014



Proceedings of the 23rd Conference of the Australian Clay Minerals Society,
3rd - 5th of February 2014.

The Papers in this volume have been peer reviewed by members of the ACMS.

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(see page 17)

Australian Clay Minerals Society Inc.

AIMS OF THE AUSTRALIAN CLAY MINERALS SOCIETY

The ACMS is a scientific society whose aim is to further the study of clay minerals and allied substances:-

- by facilitating the exchange of information among members of the Society, and, in general, all those interested in clay minerals;
- by providing facilities for reading and discussion of papers on the methods and results of research on clay minerals and allied topics;
- by stimulating interest in clay mineralogy; and,
- by encouraging the practical applications of clay mineral research.

How to join the ACMS

All those having an interest in the aims of the Society are eligible to become members.

All who attend a Biennial Conference of the Society become members for the next four years.

Alternatively, you can join the Society by contacting the Secretary, explaining your interest, and paying \$1 per year.

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ACMS Web site

<http://www.clays.org.au>



Over 50 years

2012 marked the 50th year of the ACMS

Welcome

On behalf of the Organising Committee of the 2014 Australian Clay Minerals Society (ACMS) conference and the ACMS Committee, we would like to extend a very warm welcome to you all. Although the society has met in Kalgoorlie this is the first conference to be held in Perth since the inception of the Society and the inaugural meeting at the University of Melbourne in February 1962. We hope you will find time to explore the beautiful city of Perth and for those of you who are staying in Trinity College, it is a must to visit the adjacent Swan River and the network of walking trails in Kings Park.

This conference is being held jointly with PESA (Petroleum Exploration Society of Australia) in recognition of the massive development of gas and oil resources occurring in Western Australia. The importance of clay minerals in exploration and development of hydrocarbon resources is clearly demonstrated by the diverse topics to be presented at the conference.

We hope you will enjoy a highly interactive and relaxed participation at the conference for the next two days. There an impressive list of plenary and other speakers on a range of applications of clay science in diverse environments. The conference program has been structured to give adequate time for both presentation and discussion, and we hope you will return home with many new ideas.

The Wednesday field trip will visit a bauxite mine in the Darling Range and a mineral sands mine on strand lines near Capel. We will consider the ore bodies, extraction, processing and land rehabilitation. It is likely to be hot and the terrain will be rugged so wear appropriate clothing and strong, closed shoes.

This booklet contains details of the conference program and abstracts of papers that will be presented at the conference. We thank colleagues for helping in the organisation of the technical program and the field excursion. In particular, we would like to thank Peter Self and Mark Raven from CSIRO Land and Water for administrative assistance and Horst Zwingmann and Andy Thomas for organising the PESA session. Welcome once again and we look forward to your contributions to an exciting and enjoyable meeting.

Bob Gilkes
Chair, ACMS Conference 2014
Email: bob.gilkes@uwa.edu.au

Balwant Singh
President, ACMS
Email: balwant.singh@sydney.edu.au



Conference Timetable

Monday 3rd February 2014

	Speaker	Title
8.00-8.10	Bob Gilkes	Introduction to the Conference, house keeping
Morning Session: Chair - Balwant Singh		
8.10-8.50	Bertsch, P.	Keynote address: It's been nano all along!: The occurrence, behaviour, and fate of natural and manufactured nano-minerals/ materials in the environment
8.50-9.20	Churchman, J. and Lowe, D.	Clay minerals in South Australian Holocene basaltic volcanogenic soils and implications for halloysite genesis and structure
9.20-9.50	Intamo, P., Suddhiprakarn, A., Kheoruenromne, I., Tawornpruek, S. and Gilkes, R.J.	Clay minerals in soils on mineralized limestone, Western Thailand
9.50-10.20	Sukitprapanon, T., Suddhiprakarn, A., Kheoruenromne, I., Anusontpornperm, S. and Gilkes, R.J.	Mineralogy and geochemistry of some Thai acid sulfate soils
10.20-10.50	Morning tea	
10.50-11.20	Prakongkep, N., Gilkes, R.J., Singh, B. and Wong, S.	Pyrite containing grey clay soils and sands, Swan Coastal Plain, Western Australia
11.20-11.50	Fitzpatrick, R., Raven, M. and Self, P.	Clay mineralogy as significant evidence in 4 murder investigations involving a wide range of earth materials from Perth, Adelaide, Melbourne and Sydney
11.50-12.20	Xi, Y., Sun, Z., Ayoko, G., and Frost R.	Palygorskite-supported nano zero-valent iron – a bisphenol A degradation study
12.20-12.50	Yeasmin, S., Singh, B., Kookana, R., Farrell, M. and Sparks, D.	Sorption-desorption behaviour of low molecular weight organic compounds on common soil minerals
12.50-13.30	Lunch	



Conference Timetable

Monday 3rd February 2014

Afternoon Session: Chair - Jock Churchman		
13.30-14.10	Johnston, C.T.	Keynote address: Nano-confined water in clay minerals
14.10-14.40	Jones, E. and Singh, B.	Organo-mineral associations in density fractions of contrasting soils
14.40-15.10	Kookana, R.S. and Koskinen, W.C.	Sorption of organic compounds in soils: Do we sufficiently appreciate the importance of clays?
15.10-15.40	Gates, W. Gardam, M., Hornsey, W., Gibbs, D. and Buckley, J.	A bentonite product with saline-sodic resistance
15.40-16.00	Afternoon tea	
16.00-16.30	Fitzpatrick, R., Raven, M., Self, P., Shand, P. and Grealish, G.	Irreversible clay mineral transformations from bushfires in acid sulfate soils: An indicator of soil processes involved in climate variability and climate change
16.30-17.00	Inboonchuay, T., Suddhiprakarn, A., Kheoruenromne, I., Anusontpornperm, S. and Gilkes, R.J.	Clay mineralogy and heavy metals in paddy soils, Thailand
17.00-18.00	ACMS General Meeting	

Delegates are free to have dinner at local restaurants



Conference Timetable
Tuesday 4th February 2014
The Clays and Hydrocarbons Session

8.00-8.10	Introduction to the session: Horst Zwingmann and Andrew Thomas. Joint Chair	
8.10-8.50	Dewhurst, D., Minaeian, V., Delle Piane, C., Josh, M., Esteban, L., Sarout, J. and Clennell, B.	Keynote Address: Geomechanics and petrophysics of partial saturation in clay-bearing shales
8.50-9.20	Johnston, C.T.	Surface chemistry of oil sands clay minerals
9.20-9.50	Yurikov, A., Pervukhina, M., Lebedev, M., Shulakova, V., Uvarova, Y. and Dewhurst, D.	Fracturing of Kimmeridge shale during heating
9.50-10.20.	Menacherry, S. and Thomas, A.R.	Meteoric alteration and kaolinite influence on porosity in the Mungaroo Formation, Carnarvon Basin, Western Australia
10.20-10.50	Michael, K.	More than a seal - the impact of shales on the flow and evolution of formation water
10.50-11.20	Morning tea	
11.20-11.50	Bedrikovetsky, P. and Zeinijahromi, A	Clay-fines-migration-assisted oil and gas recovery: laboratory and mathematical modelling, field cases
11.50-12.20	Delle Piane, C., Almqvist, B., MacRae, C., Torpy, A., Mory, A.J. and Dewhurst D.	Texture and diagenesis of Ordovician shales from the Canning Basin, Western Australia: Implications for elastic anisotropy and geomechanical properties
12.20-12:50	Regenauer-Lieb, K., Veveakis, M., Poulet, T. and Schrank, C.	Stimulating clay rich reservoirs: From microtomography to enhancing ductile reservoir rocks
12:50-13.30	Lunch	
13.30-14.00	Thomas, A.R., Tokic, S., Beeson, D. and van Aarssen, B.	Fibrous illite in the Clio field, Carnarvon Basin, Western Australia
14.00-14.30	Zwingmann, H. and Todd, A.	Clay mineral authigenesis – applications for hydrocarbon exploration and appraisal



Conference Timetable

Tuesday 4th February 2014

Afternoon Session: Chair – Rob Fitzpatrick		
14.40-15.10	Gates, W and Cashion, J.	Nearest neighbour distributions of site occupancies in nontronites
15.10-15.40	Mather, C.C., Gilkes R.J., Thorne, R.L. and Anand R.R.	Quantitative analysis of clay matrix within ferruginous pisoliths'
15.40-16.00	Afternoon tea	
16.00-16.30	Keeling, J., Zwingmann, H., Self, P and Raven, M.	Timing and significance of celadonite alteration in graphitic schist on southern Eyre Peninsula, South Australia
16.30-17.00	Raven, M.D. and Self, P.G.	Quantitative phase analysis of clay mineral assemblages: Methodology and accuracy
17.00-17.30	Self, P., Raven, M. and Gates, W.	Determination of the CEC and carbonate content of bentonites: Methods and accuracy
17.40-18.10	Tour of UWA Centre for Microscopy and Microanalysis	
19.00-20.00	Conference Dinner (details to be announced)	

Wednesday 5th February 2014

8.00 am-6.00 pm (approx) Field trip to Dwellingup, Capel, Bunbury
Depart Hampden Rd entrance to Trinity College