

4th EAGE Shale Workshop 2014

Shales: What do they have in common?

**Porto, Portugal
6-9 April 2014**

ISBN: 978-1-63266-051-0

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2014) by the European Association of Geoscientists & Engineers
All rights reserved.

Printed by Curran Associates, Inc. (2014)

For permission requests, please contact by the European Association of Geoscientists & Engineers
at the address below.

EAGE
PO Box 59
3990 DB Houten
The Netherlands

Phone: +31 88 995 5055
Fax: +31 30 634 3524

eage@eage.org

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2634
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

Kn 01 Keynote Lecture - Characterising Shales at Multiple Scales	N/A
<i>A. Aplin</i>	
Mo 01 Better Understanding Shales by Accurate Qualitative and Quantitative Mineralogy	1
<i>R. Adriaens, G. Mertens, E. Zeelmaekers, N. Vandenberghe, J. Elsen</i>	
Mo 02 The Role of Specific Surface Area and Cation Exchange Capacity in Determining Shale Rock Properties	6
<i>M. Josh, A. Bungler, J. Kear, J. Sarout, D. Dewhurst, M. D. Raven, C. Delle Piane, L. Esteban, M. B. Clennell</i>	
Mo 03 Caprock and Shale Gas Characterization - Appropriate Petrophysical Methods and Integration with Log Data	11
<i>M. Fleury, S. Youssef, P. Boulin</i>	
Mo 04 Permeability and Resistivity Anisotropy of Resedimented Boston Blue Clay	16
<i>A. L. Adams, J. T. Germaine, P. B. Flemings</i>	
Mo 05 Pore Space Relevant of Gas Transport in Opalinus Clay - Homogeneity, Percolation and Capillary Properties	21
<i>L. Keller</i>	
Mo 06 Quantifying Porosity, Compressibility and Permeability in Shale	26
<i>E. N. Mbia, I. L. Fabricius, P. Frykman, A. Krogsbøll, F. Dalhoff</i>	
Mo 07 Hydromechanical Characterization of Shales on Multiple Scales	31
<i>A. Papafotiou, R. Senger, L. Keller</i>	
Mo 08 Microstructure of the Shaly Facies of Opalinus Clay on the Mm-nm Scale	36
<i>M. E. Houben, G. Desbois, J. L. Urai, D. A. M. De Winter, M. R. Drury, J. O. Schwarz</i>	
Mo P01 Clay Mineral Preferred Orientation - How to Predict It and What It Might Control	41
<i>R. J. Day-Stirrat</i>	
Mo P02 Shale Gas and Oil Potential of Lower Palaeozoic Strata in the Polish Baltic Basin by Hydrous Pyrolysis	46
<i>M. J. Kotarba, M. D. Lewan, D. Wieclaw</i>	
Mo P03 The Sheet Silicates and Their Impact on the Petrophysical Parameters of Shaly Sandstone Reservoirs, Sirt Basin, Libya	51
<i>O. S. Sliman, F. Elkhatri, A. Dakhil</i>	
Mo P04 Upscaling in Anisotropic Layers with Tilt in a Symmetry Axis	53
<i>A. Stovas</i>	
Mo P05 The Paleozoic Source Rock of NW Gondwana	58
<i>F. Dartora, I. Moretti</i>	
Mo P06 Processes Governing Advective Gas Flow in the Callovo Oxfordian Claystone (COx)	63
<i>J. F. Harrington, R. C. Cuss, D. J. Noy, J. Talandier</i>	
Mo P07 Novel Apparatus and Methodology to Permanently Monitor Formation Pore Pressure in a Wellbore	68
<i>J. Park, I. Viken, J. C. Choi, B. Bohloli, Ø. Godager, K. Borgersen, E. Skomedal, A. G. Casseres</i>	
Mo P08 Capillary Seal Capacity of Cenozoic Mudstone Caprocks of Shallow Gas Occurrences, Dutch Offshore	73
<i>J. M. Verweij, V. Daza Cajigal, G. De Bruin, K. Geel</i>	
Kn 02 Keynote Lecture	N/A
<i>M. Mazurek</i>	
Tu 01 Shear Strength of Two Gulf of Mexico Mudrocks and a Comparison with Other Sediments	78
<i>B. Casey, B. P. Fahy, P. B. Flemings, J. T. Germaine</i>	
Tu 02 Mechanical Anisotropies of Shale	83
<i>R. M. Holt, A. Bauer, E. Fjær, P. Horsrud, O. M. Nes, J. F. Stenebråten</i>	
Tu 03 Seismic Characterisation of Mud-rich Sediments - Application to Seal Risk	86
<i>S. Karimi, A. C. Aplin, K. D. Kurtev, F. B. Kets</i>	
Tu 04 Creeping Behavior of Thermally and Chemically Destabilized Shale	91
<i>F. B. Kets, L. M. Duffly, A. C. Aplin</i>	
Tu 05 Thermally Induced Compaction of Shales and Its Impact on Acoustic Velocities	96
<i>A. Bauer, R. M. Holt, L. Marøen, J. Stenebråten, E. F. Sønstebo</i>	
Tu 06 Compaction and Rock Properties of Cenozoic Mudstones in the Quadrant 15, Offshore Norway	99
<i>M. Koochak Zadeh, N. H. Mondol, J. Jahren</i>	
Tu 07 Permeability and Compressibility of Resedimented Gulf of Mexico Mudrocks	104
<i>P. B. Flemings, W. Betts</i>	

Kn 03 Keynote Lecture	N/A
<i>N/A</i>	
We 01 On the Elastic Anisotropy of Shales	109
<i>L. Duranti</i>	
We 02 Mechanical Anisotropy of Gas Shales and Claystones	113
<i>R. T. Ewy</i>	
We 03 Thermal Well Stimulation in Gas Shales Through Oxygen Injection and Combustion	118
<i>G. C. Chapiro, J. Bruining</i>	
We 04 An Optimized Petrophysical and Geological Workflow for the Assessment of Mesozoic Unconventional Play	N/A
<i>S. Kumar, M. Mastrolorenzo, C. Caso</i>	
We 05 On the Water Retention Behaviour of Shales	123
<i>V. Favero, A. Ferrari, L. Laloui</i>	
We 06 Hydraulic and Gas Transport Testing of Brauner Dogger and Opalinus Clay	128
<i>C. C. Graham, J. F. Harrington, R. J. Cuss</i>	
We 07 Experimental Observations of the Flow of Water and Gas along Fractures in Opalinus Clay	133
<i>R. J. Cuss, J. F. Harrington</i>	
We 08 Gas Breakthrough and Flow Tests on Opalinus Clay - Ambiguities in the Interpretation of Experimental Data	138
<i>S. Amann-Hildenbrand, A. Busch, B. M. Krooss</i>	
We 09 Hydraulic Conductance of the EDZ around Underground Structures of a Geological Repository for Radioactive Waste	143
<i>A. Alcolea Rodriguez, U. Kuhlmann</i>	
We 10 Modeling the Hydraulic and Two-phase Flow Behaviour of the Heterogeneous, Fractured EDZ in the Opalinus Clay During the HG-A Experiment at the Mont Terri URL	148
<i>R. K. Senger, G. W. Lanyon, P. Marschall</i>	
We 11 Geomechanical Characterization and Numerical Parametrization of Opalinus Clay with Application to Underground Structures	153
<i>S. B. Giger, P. Marschall, P. Nater, W. Shiu, D. Billaux</i>	
Author Index	