PGK Petroleum Geologische Kring

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Venue:	PGK's monthly meetings are held at the KIVI building, Prinsessegracht 23, Den Haag. Drinks are served from 17:00 hrs; the lecture starts at 18:00hrs.		**www.pgknet.nl**
Membership:	Apply for membership through the PGK website. The annual fee is €15.-		
Accounts:	ABN/AMRO Bank: 88.65.82.733 (PGK, Den Haag)		

MARCH 2012 NEWSLETTER

21ST OF MARCH

The next PGK meeting will be on **Wednesday, March 21st, 2012** at the KIVI building, Prinsessegracht 23, Den Haag.

17:00-18:00 hrs: Social hour

18:00-19:00 hrs: Lecture by: Dirk Nieuwland

Fault seal prediction in sandstone reservoirs: a proven geomechanical method

Abstract on separate page

29TH OF MARCH

AAPG 2012 European Distinguished Lecture on Thursday, March 29th at Shell office, Carel van Bylandtlaan 16, Den Haag. Participants need to bring a valid ID, since the presentation will take place in the Shell head office. Registration at the entrance is mandatory.

15:30-16:00 hrs: Registration and coffee

16:00-17:00 hrs: Lecture by: Q. R. Passey My Source Rock is Now My Shale-Gas Reservoir - **Geological and Petrophysical Characterization of Organic-Rich Rocks**

Abstract on separate page

APRIL PGK MEETING:

The April meeting takes place on **Wednesday, 18th of April 2012.** Lecture by Josep Antoni Muñoz de la Fuente on "Tremp geology".

NEW MEMBERS

Application for membership has been received from Leila Bagherian (SGS Horizon), Mark Bouman (Shell), Ian Clark (Shell), Roula Dambrink (TNO), Rob van Ede (TNO), Claartje van Es (Leeds university), Richard Huis in 't Veld (Argo), Frans Kets (Leeds University), Marloes Kortekaas (TNO), Derk Straathof (UvU), Rico Tonis (TNO), Sergei Vasyutkin (Shell), Hans Veldkamp (TNO), William Walton (Shell), Peter Wynia (Fugro). If no objections are received prior to or during the next meeting, they will be admitted as members of our society.

EXCURSIONS

The excursion **Geothermal Energy in the Netherlands: a day trip to three "hot" sites** on March 9th is fully booked. If you have booked but can't make it, please contact Geert-Jan so someone else can go in your place.

The geo-gastronomic f**ieldtrip to Sicily**, from May 16–19 is almost fully booked. Please see the website for details.

Program PGK meeting Wednesday 21st of March 2012

KIVI Building, Prinsessegracht 23, Den Haag
Social hour: 17:00 - 18:00
Lecture: 18:00 - 19:00

Prediction of Fault Sealing by Cataclasis: a calibrated quantitative geo-mechanical method

D.A. Nieuwland (NewTec International B.V.)

Abstract

Sealing faults form a major element in trapping hydrocarbons. They can form isolated compartments in reservoirs, alternatively faults can form leak zones and conduits for fluid flow. Prediction of fault seal potential is therefore essential for efficient hydrocarbon exploration, field development underground gas storage and CO_2 storage.

This presentation describes a geo-mechanical method to predict the sealing potential of faults in sandstone reservoirs. The method has been calibrated on the basis of a field case with core samples, rock-mechanical tests and numerical calculations. This data was used to quantify and predict the stress regime that is required to form sealing cataclastic gouges. In order to apply this, it is required to do an in-situ stress analysis. For present day situations the World Stress Map (WSM) can be used to estimate the orientation of σ_H. However, in many instances a palaeo stress analysis is required.

The method was successfully applied and tested in two field cases. The end result is an easy to apply tool with which it is possible to predict fault sealing and to estimate the expected seal quality in sandstone reservoirs.

An easy to use tool will be presented together with guidelines to apply the method. A algorithm that can be applied to calculate fault transmissibility is under development.

Please post this page on your company's notice board. Members may be accompanied by guests!

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Program AAPG 2012 European Distinguished Lecture Thursday 29th of March 2012

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Registration and coffee: 15:30 – 16:00
Lecture: 16:00 - 17:00

My Source Rock is Now My Shale-Gas Reservoir - Geological and Petrophysical Characterization of Organic-Rich Rocks

Q. R. Passey, K. M. Bohacs, R. Klimentidis W. L. Esch, and S. Sinha (ExxonMobil Upstream Research Co.)

Many currently producing shale-gas reservoirs are overmature oil-prone source rocks containing Type I or Type II kerogen. Key characterization parameters are: total organic carbon (TOC), maturity level (vitrinite reflectance), mineralogy, thickness, and organic matter type (OMT). Recent studies indicate that although organic-rich shale-gas formations may be hundreds of meters in gross thickness (and may appear largely homogeneous), the vertical variability in the organic richness and mineralogy can vary on relatively short vertical scales (e.g. 10's cm - 1 meter). The vertical heterogeneity observed can be directly tied back to geologic and biotic conditions when deposited. The accumulation of organic-rich rocks (ORRs) is a complex function of many interacting processes that can be summarized by three main control variables: rate of production, rate of destruction, and rate of dilution. The marine realm includes three physiographic settings that accumulate significant organic-matter-rich rocks: constructional shelf margin, platform/ramp, and continental slope/basin. In general, the fundamental geologic building block of shale-gas reservoirs is the parasequence, or its equivalent, and commonly 10's to 100's of parasequences comprise the organic-rich formation whose lateral continuity can be estimated using techniques and models developed for source rocks.

Many geochemical and petrophysical techniques developed to characterize organic-rich source rocks in the oil-generation window (Ro=0.5-1.0), can be applied, sometimes with modification, to shale-gas reservoirs that currently exhibit high thermal maturity (Ro=1.1 - 4.0). Well logs can be used to calculate TOC, porosity, and hydrocarbon saturation, but in clay-rich mudstones, the fundamental definition of porosity is complicated by the high surface area of clay minerals (external and sometimes internal), the volume of surface water, and the presence of water held by capillary forces in very small pores between silt and clay size mineral grains. Moreover, SEM images of ion-beam-milled samples reveal a separate nano-porosity system contained within the organic matter, and the gas may be largely contained in these organic pores.

The use of high-vertical resolution standard logs and borehole image logs enhances the interpretation of vertically heterogenous shale-gas formations. It is important to keep in mind that kerogen occupies a much larger volume percent (vol%) than is indicated by the TOC weight percent (wt%); this is because of the low grain density of the organic matter (typically 1.1-1.4 g/cc) compared to that of common rock-forming minerals (2.6-2.8 g/cc). Well logs play a critical role in characterizing and quantifying shale-gas resources.