

**AAPG Annual Convention
Salt Lake City, Utah
May 11-14, 2003**

Marcio R Mello¹, J. M Moldowan², J Dahl³, J.M Macedo⁴, B Wygrala⁵ (1) Analytical Solutions, Rio de Janeiro, Brazil (2) Biomark Technology, Sebastopol, CA (3) Biomarker Technology, Sebastopol, CA (4) Brain Tecnologia, Rio de Janeiro, Brazil (5) IES Integrated Exploration Systems, Juelich, Germany

High Resolution Geochemistry Technology (HRGT) and Geochemical 3-D Modeling Applied to the Petroleum System Approach

Hydrocarbon exploration in onshore and offshore deep-water frontier areas entails both high costs and increased inherent risk of dry holes. The main uncertainty in this exploration setting is the presence of active petroleum systems. In this context the prediction and characterization of generative hydrocarbon source rocks to charge potential traps is imperative. This paper shows some examples of the application of several predictive high resolution geochemical and 3-D basin modeling tools as fully integrated models. The HRGT technologies, ranging from age-related molecular geochemistry to diamondoids, compound specific isotope analyses of biomarkers (CSIA-B) and of diamondoids (CSIA-D) and gas geochemistry are of fundamental importance to evaluate the hydrocarbon potential in a sedimentary basin in frontier areas. When the HRGT data are integrated with 3-D Petroleum Systems Modeling in a petroleum systems context, these techniques are powerful tools for regional as well as prospect-scale evaluations of hydrocarbon charge and accumulation risk. This paper illustrates examples from several sedimentary basins in the world.