

GeoResources

Reservoir Rock Analysis



Integrated Analysis of Reservoir Quality & Development From Pore Scale to Reservoir Scale Where Science Meets Industry

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Benefits for HC Exploration

- Multi-scale analysis of potential reservoir rock units from local well / outcrops to basin scale
- Macro- to microscopic analysis of rock parameters from core / outcrop to thin section and upscaling of results from pore scale to reservoir scale
- Multiple microscopic analysis of thin sections for detailed reservoir evaluation, optional Scanning Electron Microscopy for high-resolution analysis of specific pattern
- Macro-CT for in-situ high-resolution 3D analysis of plugs and cores (max 9,8") - porosity, fractures & rock texture
- Integrated lithological analysis (macro- & microscopic) for definition of lithotypes with specific reservoir potential
- Identification of productive reservoir lithotypes within the reservoir formation & quantification of net-reservoir unit
- Correlation of well logs with core descriptions for the definition of electric log facies based on studied cores
- Spatial data integration mapping and distribution of reservoir relevant parameters in 1D to 3D
- Outcrop analogue studies of reservoir units for better understanding of spatial development of reservoir quality

Add Ons - for reservoir and HC system analysis

- Petrophysical analysis for enhanced reservoir properties - porosity, permeability, grain density, weight
- Geochemical analysis (XRD, RFA) for detailed quantification of mineralogy, particularly clay mineralogy
- Palynostratigraphical correlation of reservoir units across the play/basin for play/basin wide reservoir modelling
- Optical Kerogen Analysis integrated analysis of kerogen composition and preservation for improved evaluation of hydrocarbon source rock potential

Macroscopic Analysis - Core & Outcrops



- Detailed core/outcrop description logs & photos
- Analysis of core quality, pre-selection of plugs/samples
- Macroscopic description as lithological core/outcrop logs including: Rock type, color, texture, grain size & sorting, sedimentary structures, fossils and accessories
- Macroscopic analysis of flow relevant pattern fractures, porosity, cements and rock matrix (for lithological logs)
- Macroscopic definition of lithotypes and correlation with specific reservoir potential
- First approach on reservoir quality and quantification of productive net-reservoir lithologies within reservoir unit
- Correlation of core descriptions with well logs for definition of electric log facies based on studied cores



Microscopic Analysis - Multiple Microscopy

- Microscopic analysis of reservoir relevant rock pattern: mineralogical composition, diagenesis, cements/matrix, and rock texture (grain size, sorting, roundness)
- Analysis of fluid flow relevant pattern: micro-structures, micro-fractures, porosity (volumen and connectivity)
- Microscopic definition of lithotypes with specific reservoir potential for detailed reservoir evaluation
- Thin section analysis by different microscopic methods.



- Normal light microscopy (normal & polarized light) for standard petrographical analysis
- Cathodoluminescence microscopy for enhanced analysis of cements, diagenesis and mineralogical composition
- Fluorescence microscopy for organic matter and enhanced carbonate (cement) analysis
- Digital microscope images multiple image analysis incl. porosity analysis and high-resolution composite pictures

Enhanced Reservoir Rock Analysis



- Scanning Electron Microscopy (SEM) plus EDAX analysis
 high-resolution analysis of rock texture, diagenesis, cementation and micro-fractures
- Element mapping for detailed mineral & cement analysis
- In-situ analysis of (micro)porosity development & timing



- Macro-CT high-resolution, non-destructive 3D analysis of rocks and cores - up to full core size (max 9,8")
- 3D analysis and visualization of porosity and fracture networks (isolated from rock matrix)
- Spatial integration of all data from core logs to CT

 mapping and distribution of reservoir relevant
 parameters in 1D to 3D models from local to basin scale

Projects

including Reservoir Rock Analysis:

- Depositional systems, facies analysis and reservoir development, Mesozoic, SW-Germany
- Rift basin analysis and reservoir development, Tertiary, SW-Germany
- Multidisciplinary analysis of unconventional shale plays, Silurian, Arabia
- Basin development facies analysis and hydrocarbon potential, Silurian-Ordovician, N-Poland
- Cenozoic rift basin and hydrocarbon system development, SW-Germany
- Reservoir analysis based on wells and outcrop analogue studies, Rotliegend & Buntsandstein -SW-Germany
- Integrated basin and hydrocarbon system analysis Palaeozoic, Saharian Basins, Algeria
- Integrated basin and reservoir analysis Atlantic Basins, Southern Morocco
- Outcrop analogue analysis of Triassic carbonate platforms for producing gas reservoirs Italy
- Carbonate reservoir analysis, Palaeozoic Spain



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