



**X-ray diffraction services brochure.**

A photograph of a rock sample with various mineral deposits. The rock is light-colored and has several bright blue-green mineral veins and patches. The background is a blurred natural setting.

**Winner of the  
“Reynolds Cup  
2016 and 2020”**

**aka “the world championship  
of quantitative mineralogy”**



# MINERALOGY – XRD

## X-ray diffraction (XRD): bulk sample mineralogy

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XRD is the ideal tool for basic mineralogical characterization of source rocks, reservoirs and seals. Although XRD is considered a routine analysis, the results are strongly dependent on the skills of the operator. The robustness of Qmineral's mineral quantification procedure was rewarded by a 1st place in the 8th Reynolds Cup (edition 2016 and 2020 – aka "the world championship of quantitative mineralogy"). For Quantitative Phase Analysis (QPA), both sample preparation and data processing are crucial. The systematic approach taken by Qmineral guarantees excellent reproducibility and accuracy. Bulk samples are finely ground in a liquid slurry and spray-dried. For the data processing of the bulk analyses, we combine the advantages of both the profile summation and the Rietveld method.



Each non-clay mineral is quantified individually. Clays are quantified in groups. To allow distinction between illite and smectite equivalents, an additional CEC analysis can be performed. This bulk sample analysis can be combined with a detailed clay analysis to obtain a fully detailed, combined mineral analysis (see further in this brochure).

Carbonates are subdivided to the highest possible level, yielding average Fe contents of Dolomites, distinction of Ankerites with different Fe-contents, distinction between Calcite and high-Magnesium Calcite, etc.

There is no restriction in sample form: we accept powders, trims, plugs, cores, side wall cores, etc.

The average accuracy in our 2020 Reynolds cup results, is better than  $\pm 0.3\%$  for non-clays and  $\pm 2.1\%$  for the clay minerals.

Analysis	Required sample size	Turnaround time*
Quantitative mineralogy by XRD – bulk sample analysis	4 grams	2 weeks
Quantitative mineralogy by XRD – bulk sample analysis + CEC analysis	4 grams	2 weeks
Bulk sample mineralogical analysis by XRD combined with chemical analysis by XRF for establishing formation-specific correlations of mineralogy with chemistry	6 grams	2 weeks

(\*) Depending on the number of samples. Rush analysis possible on demand.



# MINERALOGY – XRD

## (DETAILED CLAY ANALYSIS)

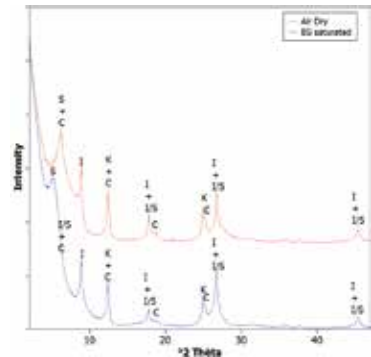
### X-ray diffraction (XRD): detailed clay mineralogy

For the detailed study of clay minerals, Qmineral uses a thorough preparation to remove cementing agents and to extract the size fraction of interest. Oriented slides of these clay-enriched fractions are measured by X-ray diffraction. The subsequent quantification of the clay fraction is done by modelling of the X-ray diffraction patterns.

Not only quantitative information is provided, but also detailed information on the types of minerals present, the degree of mixed-layering, the expandability, the amount of Fe in the crystal structure and the average crystallite thickness. Accurate densities can be calculated from these mineralogical data.

All kinds of samples can be analyzed including carbonates, sandstones, loose sediments, etc.

*Extracted clays are measured in both Ethylene Glycol and Air Dried conditions to allow the clay's identification and quantification.*



Analysis	Required sample size	Turnaround time
Detailed clay mineral analysis of fine fraction	Clay rich: 10g Clay poor: 25g	3 weeks
Combined mineralogical analysis: Bulk sample analysis + detailed clay analysis	Clay rich: 10g Clay poor: 25g	3 weeks

# SAMPLE SUBMISSION

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Please send your samples to the following address:

Qmineral BV  
Gaston Geenslaan 1  
3001 Heverlee  
Belgium

T: +32 16 751377  
info@qmineral.com

# REQUEST FOR ANALYSIS

Qmineral Analysis and Consulting

Carrier: _____	Waybill #: _____	# of Packages: _____	# of Samples: _____
<b>FOR OFFICE USE ONLY</b> Date Received: _____		Batch ID: _____	
Priority: <input type="checkbox"/> Normal (may vary depending on package and time of year - please enquire) <input type="checkbox"/> RUSH (required by) _____ (Note: subject to surcharge, method dependent)		Confirmation of Sample Receipt: <input type="checkbox"/> Yes <input type="checkbox"/> No By: E-mail: _____	
Client Info: Client Batch #: _____		Shipment #: _____	
Quote #, PO #, Proforma #: _____		Project: _____	
Company: _____ Attn: _____ Address: _____ _____ Phone: _____ E-mail: _____		Invoicing instructions: _____ Company: _____ VAT nr.: _____ Address: _____ _____ Phone: _____ E-mail: _____	
Report: <input type="checkbox"/> Written <input type="checkbox"/> Spreadsheet			
Return		Dispose	Store
<input type="checkbox"/> After Analysis	<input type="checkbox"/> After 60 days	<input type="checkbox"/> After 60 days (€0)	<input type="checkbox"/> €0.25/sample/month
Return Samples To: Company: _____ Address: _____ _____ Attn: _____ Phone: _____		Method of Sample Return: <input type="checkbox"/> At cost <input type="checkbox"/> Our Carrier Account: _____ Carrier Name: _____ Account #: _____ Phone: _____	
<b>Special Instructions/Comments:</b> _____			
_____			
_____			
<b>AUTHORIZED SIGNATURE:</b>			

FOR FASTER TURNAROUND TIME, EMAIL A COPY OF YOUR SUBMITTAL FORM TO <a href="mailto:info@qmineral.com">info@qmineral.com</a>			
<b>Client Name:</b> _____			
# of samples	Sample Numbers (list all or range)	Sample Type	Requested Analysis



# of samples	Sample Numbers (list all or range)	Sample Type	Requested Analysis