X-ray Mineral Services Ltd

The Reynolds Cup competition

The Reynolds Cup is a bi-annual round-robin competition held by the Clay Minerals Society for quantitative mineralogical analysis on clay-bearing type samples.

The 2018 competition comprised 88 participants from 27 countries, including independent companies, universities and other research bodies.

Thanks to the continuing improvements in our methodologies, commitment to research and investment in state-of-the-art instrumentation, we have achieved very successful results in the last 2 competitions!

In 2018, overall we were placed **8th** position out of 88 participants. While in 2016, we achieved **4th** position on the carbonate-bearing shale sample out of 83 participants.

These excellent results have been achieved with the use of only X-ray Diffraction (XRD) and X-ray Fluorescence (XRF) while most of the top ten participants used several additional techniques to support their results, including Infrared Spectroscopy (IR), thermal analysis and Scanning Electron Microscopy (SEM).

4th position in 2016 on the shale sample

Reynolds Cup 2016 - Carbonate-bearing shale			
Mineral	RC 8-2 (m%)		
	Actual (m%)	Submitted (m%)	Δ
Quartz	15.7	14.2	1.5
K-Feldspar group	3.4	4.0	0.6
Plagioclase group	4.0	3.9	0.1
Calcite	11.4	12.0	0.6
Dolomite/ankerite	6.4	4.5	1.9
Pyrite	2.5	3.1	0.6
Rutile	0.1	0.0	0.1
Anatase	2.3	2.3	0.0
Amorphous group	5.0	3.9	1.1
Total Non-clay	50.8	47.9	6.5
Kaolinite	12.5	10.8	1.7
Mica (dioctahedral)	19.8	18.2	1.6
Smectite (dioctahedral)	11.4	10.5	0.9
Chlorite (trioctahedral)	5.5	9.6	4.1
Total clay/phyllosilicate	49.2	49.1	8.3
Total identified	100.0	97.0	14.8
Bias non-clay		6.5	
Bias clay		8.3	
Total bias		14.8	

8th position in 2018 overall

Reynolds Cup 2018 – Carbonatite			
Mineral	RC 9-3 (m%)		
	Actual (m%)	Submitted (m%)	Δ
Calcite	13.9	12.8	1.1
Dolomite/ankerite	21.9	23.5	1.6
Witherite	6.4	7.5	1.1
Fluorite	3.9	2.6	1.3
Apatite	3.4	3.4	0.0
Diopside/clinopyroxene	6.7	9.5	2.8
Forsterite/olivine	7.0	5.3	1.7
Sodalite	2.5	3.8	1.3
Barite	2.6	1.0	1.6
Vanadinite	0.8		0.8
Zircon	0.4		0.4
Dravite (Tourmaline)	1.0		1.0
Total Non-clay	70.5	69.4	14.7
Mica (trioctahedral)	11.9	13.6	1.7
Talc	8.0	4.4	3.6
Vermiculite (trioctahedral)	4.3	5.2	0.9
Chlorite (trioctahedral)	5.3	6.3	1.0
Total clay/phyllosilicate	29.5	29.5	7.2
Total identified	100.0	98.9	21.9
Bias non-clay		14.7	
Bias clay		7.2	
Total bias		21.9	

"If you are considering getting a mineral analysis of a clay-bearing sample from any type of laboratory, and where accuracy is important, simply ask the lab where they have placed in the Reynolds Cup"

Douglas K. McCarty
President of the
Clay Minerals Society

In the last two competitions, we have identified and quantified the majority of minerals within 3 wt.% absolute error. According to Calvert et al. (1989), results within this error, between the actual and calculated percentages, are considered to be "highly accurate".

X-ray Mineral Services aims to provide a rapid, reliable and cost effective analytical service for the finest mineralogical analysis.

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