CONFIDENTIAL REPORT

XRD Analysis

Prepared for Carlincore Resources Ltd.

By Steven Creighton, PhD
Saskatchewan Research Council
Mining and Minerals

SRC Publication No. 10400-28C17

August 2017

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Advanced Microanalysis Centre™
Saskatchewan Research Council
125 – 15 Innovation Blvd.
Saskatoon, SK S7N 2X8
Tel: 306-385-4066

Sample preparation

A random aliquot of the ground sample was back-packed into a stainless steel holder and secured in place with a plastic backing. The minimum sample thickness was 1 mm – sufficient to be considered infinitely thick for X-ray diffraction using a Cu source.

XRD Analysis and data processing

Samples were irradiated with Cu Kα radiation (λ=1.54056 Å) in a Bruker D4 Endeavor X-ray diffractometer (XRD) operating at 1.6 kW power (40 kV accelerating potential and 40 mA current). The XRD is outfitted with a high speed LynxEye silicon strip detector with fluorescence background suppression. Samples were measured from 3.5 to 70° 2θ with a 0.02° step size and 0.35 seconds dwell time with a 0.300° divergence slit.

The raw diffraction data was processed using MDI Products Jade software for mineral identification and quantification. Minerals were identified based on the observed interatomic spacing of the crystal lattices present constrained by common mineral associations. All mineral abundances were calculated using whole-pattern fitting algorithms with peak intensities scaled with internally-consistent relative intensity ratios using patterns derived from the American Mineralogist Crystal Structure Database (AMCSD).

Detection and precision limits

The detection limit of XRD analysis is controlled by the abundance and symmetry of all the minerals present in the sample. Low symmetry minerals are harder to detect in the presence of higher symmetry minerals. The estimated detection limit for most minerals is 1-3 wt.%.

Based on repeat analyses of secondary standards, the estimated accuracy of the clay analysis is ± 3 wt.%.

Results

The following pages contain the results of the XRD mineral identification and quantitative mineral abundances. A summary spreadsheet of the mineralogy is also included.

Client: Carlincore Resources Ltd.
Contact: Linglin Chu
Samples: 1

SRC Advanced Microanalysis Centre™
125 - 15 Innovation Blvd, Saskatoon, SK, S7N 2X8
Tel: 306.385.4066 Email: microlab@src.sk.ca

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XRD Analysis

Random Oriented Backpacked Mount

Sample	Quartz wt%	Muscovite wt%	Microcline wt%	Hematite wt%	Chlorite wt%	Biotite wt%	Total
155713	37.8	3.9	9.9	3.3	33.4	11.7	100.0

Bruker AXS D4 Endeavor, Cu Kα radiation; 40 kV, 40 mA; 5-70° 2θ; rotated

-155713-

FILE: [155713.raw] 155713
SCAN: 4.0/69.9946/0.01997/49.7(sec), Cu(40kV,40mA), I(p)=35111, 06/27/17 03:33p
PROC: [WPF Control File]

- ☑ K-alpha2 Peak Present
- ☑ LS Weighting in 1 / Sqr(I)
- ☑ Allow Negative Isotropic B
- ☑ Allow Negative Occupancy
- ☑ Apply Anomalous Scattering

[Diffractometer LP] Two-Theta Range of Fit = 5.0 - 70.0(deg)

- ☑ Specimen Displacement - Cos(Theta) = 0.052162(0.00084)
- ☐ Monochromator Correction for LP Factor = 1.0
- ☐ K-alpha2/K-alpha1 Intensity Ratio = 0.5

Profile Shape Function (PSF) for All Phases: Lorentzian, Fixed-BG, Lambda=1.54059Å (Cu/K-alpha1)

Phase ID (6)	Source	I/Ic	Wt%	#L
Quartz - SiO_2	PDF#98-091-4776	4.52(5%)	37.8 (2.2)	18
Muscovite - $Al_{2.88}Fe_{.12}O_{12}Si_3K$	PDF#98-091-2078	0.44(5%)	3.9 (0.5)	200
Microcline - $(AlSi_3)(K_{.89}Na_{.11})O_8$	PDF#98-091-1642	0.61(5%)	9.9 (0.7)	300
Hematite - Fe_2O_3	PDF#98-090-8424	3.01(5%)	3.3 (0.3)	15
Clinochlore - $Mg_5Al_2Si_3O_{18}H_8$	PDF#98-090-4198	0.96(5%)	33.4 (2.1)	283
Biotite - $KFe_{1.392}Mg_{1.161}Ti_{.276}(Si_{2.792}Al_{1.208})O_{12}$	PDF#98-090-2548	1.80(5%)	11.7 (1.0)	203

NOTE: Fitting Halted at Iteration 22(3): R=4.39% (E=0.24%, R/E=18.34, P=41, EPS=0.5)