

X-RAY DIFFRACTION ANALYSIS

SGS HIGH DEFINITION MINERALOGY SERVICES

OPTION 1: QUALITATIVE XRD ANALYSIS

All minerals identified by X-ray diffraction analysis will be reported and grouped into major (>30%), moderate (10-30%), minor (2-10%) and trace (<2%) amounts. Identification and classification of abundance are based on relative peak heights and mineral crystalline structure.

OPTION 2: SEMI-QUANTITATIVE XRD ANALYSIS

All minerals identified by X-ray diffraction analysis will be reported and grouped into major (>30%), moderate (10-30%), minor (2-10%) and trace (<2%) amounts. In addition, mineral abundances (in weight %) generated by RIR (or Rietveld) XRD analysis will be reconciled with a whole rock analysis plus the analysis of any other major elements contained in the sample and reported. Whole rock analysis by X-ray fluorescence spectroscopy includes SiO_2 , Al_2O_3 , Na_2O , K_2O , CaO , MgO , Fe_2O_3 , Cr_2O_3 , MnO , TiO_2 , P_2O_5 , V_2O_5 and LOI.

OPTION 3: CLAY SPECIATION XRD ANALYSIS

Clay minerals identified by X-ray diffraction analysis will be reported and grouped into major (>30%), moderate (10-30%), minor (2-10%) and trace (<2%) amounts. Due to the poor crystallinity of clay minerals, separation of the samples with centrifuge followed by a series of procedures (e.g. the addition of ethylene glycol and high temperature heating) is necessary to differentiate between clay species.

OPTION 4: SEMI-QUANTITATIVE CLAY SPECIATION XRD ANALYSIS

Clay minerals identified by X-ray diffraction analysis will be reported and grouped into major (>30%), moderate (10-30%), minor (2-10%) and trace (<2%) amounts. Due to the poor crystallinity of clay minerals, separation of the samples with centrifuge followed by a series of procedures (e.g. the addition of ethylene glycol and high temperature heating) is necessary to differentiate between clay species. In addition, mineral abundances for the bulk sample (in weight %) generated by RIR (or Rietveld) XRD analysis will be reconciled with a whole rock analysis plus the analysis of any other major elements contained in the sample and reported. Whole rock analysis by X-ray fluorescence spectroscopy includes SiO_2 , Al_2O_3 , Na_2O , K_2O , CaO , MgO , Fe_2O_3 , Cr_2O_3 , MnO , TiO_2 , P_2O_5 , V_2O_5 and LOI.

OPTION 5: QUANTITATIVE XRD OF FREE SILICA (ALPHA QUARTZ) – BULK SAMPLE

The percent determination of free silica (as alpha quartz) in a bulk sample will be calculated and reported. Calculation of free silica is based on the comparison of the major quartz peak intensities of the sample with that of a standard LiF mixture.

OPTION 6: DETERMINATION OF RESPIRABLE SILICA (FREE QUARTZ) – AIR FILTER

The determination of respirable silica (in milligrams) will be calculated and reported. The sample will be received by mineralogy loaded onto a 25 mm, 0.5 μm pore size silver membrane filter. The filter is analyzed over 2 major diffraction peaks (31.04 degrees and 58.95 degrees 2 theta) in order to avoid errors due to peak overlap with other minerals.

The calculation for the amount of quartz present is based on the comparison of the normalized peak intensities of the sample with the peak intensities of the sample with the peak intensities of known standards. A standard calibration is measured to ensure quality of instrumentation.

CONTACT INFORMATION

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