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## *Looking beyond chemistry – XRD for exploration and processing of ores*

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Decreasing ore qualities and increasing prices for raw materials require a better control of processed ore and a more efficient use of energy. Traditionally quality control in mining industries has relied on time consuming wet chemistry or the analysis of the elemental composition. The mineralogy that defines the physical properties is often monitored infrequently, if at all. The use of high speed detectors has turned X-ray diffraction (XRD) into an important tool for fast and accurate process control. XRD data and their interpretation do make the difference in the identification of minerals, in describing their distribution in ore bodies and in their beneficiation during processing. The use of modern techniques such Partial Least Square Regression (PLSR), Principal Component Analysis (PCA) or full pattern Rietveld quantification will be discussed during the presentation as well as the importance of adequate sampling and the correlation with sample chemistry. The practical use will be illustrated on case studies.

**Keywords:** Mineral quantification, PLSR, Rietveld