

Comprehensive mineralogical, elemental and texture characterization of battery black mass



X-ray Mineral Services has developed a comprehensive analytical workflow for the characterization of shredded batteries and black mass.

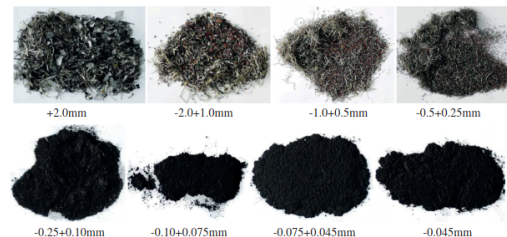
Our **META** analytical workflow is a comprehensive materials characterization workflow. It consists of **Minerals, Elements, Texture** and data **Analytics**. For this application, the META workflow deployed incorporated QXRD, ICP, LIBS, XRF and automated mineralogy (AMICS) techniques, providing cross-validated analytical data. Data are consolidated in Spotfire® to provide a compositional atlas and a confirmation of black mass content for valorization.

The composition of the black mass was determined by x-ray diffraction, with SEM automated mineralogy (AMICS) used to produce compositional maps, textural attributes and metal deportment. ICP acid digestion and LIBS provide a chemical assay of black mass.

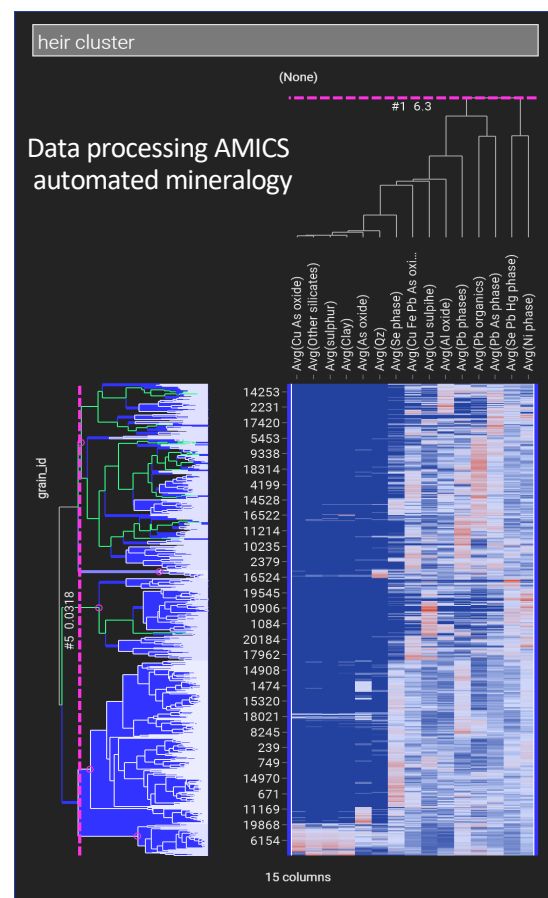
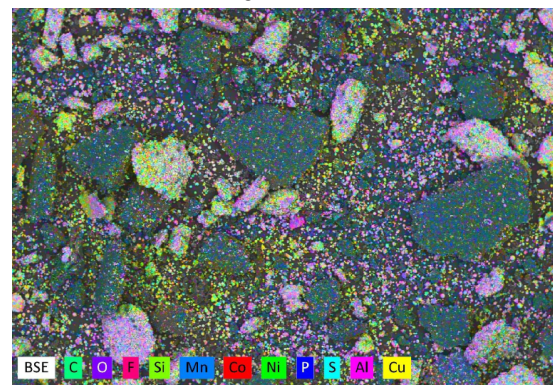
XMS have also developed portable analytical tools for the characterization of black mass based on ED-XRF. This rapid non-destructive technique can provide onsite grading and quality control data for recycled shredded batteries control and black mass product.

All analytical data are consolidated in Spotfire® to enable data modelling and data verification for mineralogical and elemental techniques. Variations in grain-size determined from AMICS are compared with representative samples from XRF and multiple spots from LIBS analysis to optimize sampling frequency and representativity issues. Spotfire® enables short and long-term quality control and the development of inhouse standards. XMS also provide equipment, training and monitoring services for onsite applications.

Shredded batteries & black mass



BSE image of Black mass



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