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Mineral Composition in Some Brazilian Coal Cleaning Residues and Effects On Acid Generation and Human Health

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In this study we characterized minerals in 39 samples of coal cleaning residues (CCR) from Santa Catarina, Brazil coals.

To characterize the minerals we used, X-ray Diffraction, Micro-Raman Spectroscopy, Mössbauer Spectrometers, Transmission Electron Microscopy, Scanning Electron Microscope and X-ray Fluorescence Spectrometry.

The major minerals identified in the Santa Catarina CCR are chiefly represented by quartz, kaolinite, and pyrite, while the minor minerals include, illite, K-feldspar, gypsum, calcite, oligonite, barite, hematite, ankerite, barite, jarosite, siderite, microcline, brucite. Other phases such as mullite, melilite, talc, marcasite, pyrrhotite, galena, sphalerite, aragonite, calcantite, gibbsite and others occur as accessory minerals. Pyrite is also relatively abundant in some samples, making up to around 10% of the mineral matter. The sulphate minerals such as jarosite and others, probably represent oxidation products of pyrite, developed during exposure or storage.

TEM/EDS, SEM/EDX, XRF and XRD analyses were conducted on various samples from the Santa Catarina CCR with the aim of improving the understanding of their mineralogy and geochemistry and effects on acid generation, the environment and human health.