

## **Peroxide Fusion: a Powerful and Safe Dissolution Method for Mining Sample for Analysis by ICP and AA**

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ICP and AA spectrometry are widely used in the mining industry. As for any other analytical process, sample preparation is crucial in order to obtain accurate and precise results. Acid digestion is the common dissolution method used for mining related samples. Unfortunately, acid digestion of mining samples requires numerous manipulations of concentrated acids, including perchloric acid ( $\text{HClO}_4$ ) that is explosive and hydrofluoric acid (HF) that is extremely dangerous for human health. Moreover, it is often difficult to get full dissolution of the sample even when using these hazardous chemicals.

Peroxide fusion is an advantageous alternative to acid digestion to prepare mining samples for ICP and AA analysis. Sodium peroxide ( $\text{Na}_2\text{O}_2$ ) is used to oxidize the sample that becomes soluble in a diluted acid solution. Peroxide fusion is a powerful method that allows complete dissolution of numerous refractory compounds like chromite, magnetite, ilmenite, rutile, and even silicon, carbides, alloys, and noble metals. Peroxide fusion can be performed with automated systems to increase productivity, improve safety, maintain repeatable preparation conditions, and avoid spattering and cross-contamination.

The presentation will introduce the basics of sample preparation by peroxide fusion and demonstrate its efficiency with examples related to the mining industry.