



Minerals | F¹⁹ Content in Fluorspar

Introduction

The mineral Fluorspar is the most important source of fluorine in the world. Elemental fluorine is widely used for the preparation of various fluorides (fluorinating agents), for the fluorination of organic compounds and for the preparation of commercial fluorocarbons such as polytetrafluoroethylene, known by the commercial name of Teflon.

It is therefore important to determine the fluorine content of fluorspar for commercial and quality control purposes. Current wet chemical methods for fluorine determination are time-consuming operations, require skilled chemists and involve the use of potentially hazardous chemicals.

Progression's Magneflow[®] NMR technology offers a simple, non-destructive and rapid method for measurement of fluorine in Fluorspar. It is intended for routine analysis in a production environment without any requirement for specialist operator training.

Benefits

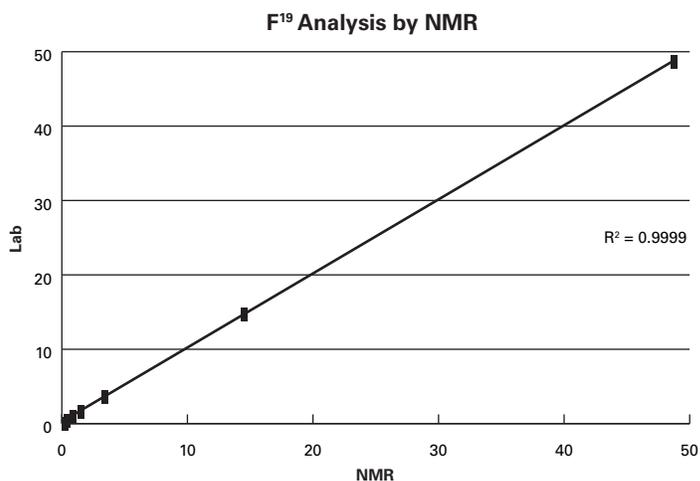
- Direct analysis of F¹⁹
- Fast results in less than 5 minutes
- Non-destructive analysis
- No sample preparation necessary
- Highly repeatable analysis
- Operator independent
- Chemical-free analysis
- Pre-loaded method and calculations

Sampling

Fluorspar samples can be manually or automatically taken from the plant for Magneflow analysis. The samples (40g) are then analyzed in less than 5 minutes to provide an accurate F¹⁹ determination. No sample preparation is required such as grinding, weighing or drying. Since the Magneflow NMR technology measures 100% of the sample in the testing probe, the analysis is not affected by color, particle size, or other matrix effects.

Calibration and Results

The lab or on-line Magneflow system is calibrated versus traditional lab analysis. The calibration is generated by Progression staff or local plant staff. The linear calibration models are easy to generate with a limited number of reference samples. Once established these models are very robust and do not require adjustment.



This graph demonstrates a typical performance for the Magneflow NMR technology compared with lab reference data for the F¹⁹ content in fluorspar. In most cases, better quality reference data will result in better calibration results. The Magneflow NMR calibration performance for stability is excellent in both the short-term as well as long-term repeatability. The mid-range precision (95% confidence) of <0.04% is expected.