Carbon | **Total Content in Coal**

Summary

The Titan CCA™, Progression, Inc.'s newest analyzer combines Nuclear Magnetic Resonance (NMR) and Laser Induced Breakdown Spectroscopy (LIBS) to provide an accurate measurement of the total carbon content of coal.

Progression's proven technologies are now paving the way for success in improving environmental performance and renewable energy production. Our industrial NMR and LIBS analyzers have been effectively demonstrated in various industries including petrochemicals, coal, mining and biofuels.

Benefits

▌ Improved plant efficiency

▌ Better classification of coal

▌ Lower operating costs

▌ Lower maintenance costs

▌ Results in seconds

▌ No sample preparation

Sampling

To ensure that the measurement is representative of the whole, a single result is derived from four thirty second sub-sample analyses. Each sub-sample analysis consists of the collection of UV-spectra (230 – 330nm) from at least 60 laser-induced plasmas and applying a chemometric model to the sum of those spectra. The results are then combined to produce the final measurement for the sample. The Titan CCA total carbon measurement is calculated from 240 laser-induced plasmas, collected as the sample is conveyed through the system. Total measurement time takes 120 seconds and an update is available every 30 seconds.

Calibration and Results

The calibration was created from seven coal samples that were provided to Progression by a regional utility. These were also sent out to a 3rd party laboratory for analysis and to be used as a reference. Based on the results, the percent carbon for these samples ranged between 55.5 – 74.6%. Of the seven samples, five are in the 55 – 61% range and 2 are in the 69 – 75% range. The Titan CCA delivered a calibration with $R^2 = 0.99$ and a total model standard deviation of 0.27%. This model serves to show that in the simplest case, the system can provide a consistent measurement of total carbon.

Progression Total Carbon vs. Lab