



Coal analysis at power generation facilities using NMR

Summary

Nuclear Magnetic Resonance (NMR) provides nondestructive, accurate measurement of moisture and caloric values in coal. On-line coal measurements offer potentially significant economic and environmental benefits in the power generation industry.

progression inc. is the leader in the development and service of on-line NMR in the chemical industry with over 100 process NMR installations worldwide. In 2003, **progression** won the prestigious R&D 100 award for the development of its second generation on-line NMR system—the MagModule II. The company has historically focused on the polymers industry; however, in the past two years, **progression** has expanded into the mining industry successfully entering phosphate rock mining. Similarly, the company plans to provide the coal industry with accurate on-line BTU and moisture analysis.

Benefits

On-line NMR can provide economic and environmental benefits to coal fired power plants. **progression**'s instrument generates an analysis approximately every 5 minutes. This information can be transferred to the plant's advanced process control system for closed loop control.

Improved control of the combustion process would allow the plant to achieve higher boiler efficiency, reduced emissions of pollutants, and realize higher stream factors by reducing boiler fouling.

Sampling

In conjunction with the NMR instrument, **progression** designs and installs application specific, customized sampling systems. Samples are taken automatically from the process stream. Because of the nondestructive nature of NMR testing, the samples may be returned to the process stream after analysis. Further, the relatively small size (~30 ft³) of the instrument allows for optimal placement near sample points.

Calibration and results

System calibration and modeling is performed by **progression**. Initial calibration is typically performed with the customer taking a series of samples from the instrument to be analyzed by a laboratory to provide reference data.

