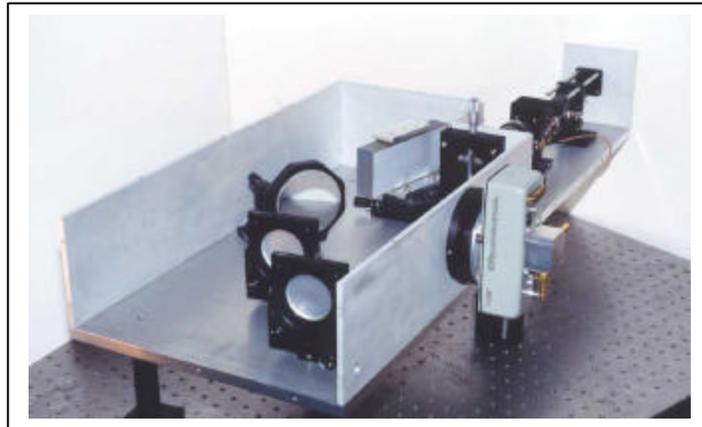


Compact High Resolution Spectrometer (TechID 1564)

The Compact High Resolution Spectrometer (CHRS) detects and continuously monitors toxic metals and uranium isotopes in stack gases. The CHRS is a high-resolution, solid-state, compact spectrometer and detection system that is used with an air-inductively coupled plasma (ICP) and a novel reduced-pressure sampling system. The versatile optical spectrometer can be used for field and process applications. It has no moving parts and an extremely rapid (milliseconds) sequential or simultaneous selection of contaminant wavelengths. A 0.38-m echelle-grating spectrometer with an acousto-optic tunable filter (AOTF) performs grating-order selection. The air-ICP atomic emission spectrometry (AES) system can monitor alpha-emitting actinides and EPA-regulated metals in stack gases.



Developers:

- US DOE, Ames Laboratory; Iowa State University, Ames, Iowa

Applications:

- DOE Mixed Waste Thermal Treatment units (TSCA, WERF, CIF)
- DoD/DOE demilitarization (Confined Burn Facility)
- 1997, 1998, and 1999 demonstrations at Mississippi State University's Diagnostic Instrumentation and Analysis Laboratory (DIAL)

Benefits:

- All solid-state spectrometer with no moving parts that provides the same resolution as a 1- to 1.5-meter spectrometer at a fraction of the size, weight and cost of conventional spectrometers
- Superior resolution allows the monitoring of actinide isotopes as well as RCRA metals
- Real-time analysis with reduced interferences enables field operation analysis of complex sample matrices
- EPA Maximum Achievable Control Technology (MACT) compliant technology promotes public confidence
- Cost savings afforded through on-line process control, reducing the need for intensive front-end waste characterization

Status:

- September 1997 EPA Rotary Kiln Incinerator Simulator field test
- Iowa State University has offered the technology for licensing
- Innovative Technology Summary Report Available (www.cmst.org)