Particle and Powder Measurements

**Particle and Powder Research**

Division activities involve the development and application of advanced measurement methods and associated standard materials for the characterization of industrial powders and environmental particles. These methods include both single particle microanalysis and carbon analysis of bulk particulate samples.

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**Measurement Techniques and Methods**

**Optical Techniques**
- Ellipsometry
- IR-Reflection Spectroscopy
- **Non-linear Optical Spectroscopy**
- Thermal-Optical Analysis
- Polarized Light Microscopy

**Mass Detection Techniques**
- LMMS
- TOF-SIMS
- Isotope Ratio Mass Spectrometry
- Accelerator Mass Spectrometry

**X-Ray and Electron Techniques**
- XRD
- micro-XRD
- micro-XRF
- ESEM
- SEM
- TEM
- EBSD
- XPS
- AES

**Data Processing Techniques**
- X-ray spectral processing - DTSA
- Compositional Mapping
- Chemometrics
- Image Analysis
- XPS Standard Test Data
Selected Technical Activity Reports

Relating to Individual Particle Measurements

- Chemical Characterization of Magnetic Nanoparticles at High Spatial Resolution
- Measurement of Diesel Exhaust by Laser Microprobe Mass Spectrometry
- Seasonal and historical records of aerosol carbon and 14C in Greenland snow and ice: initial studies
- Fractal Dimension of Particle Outlines: Meaning, Limitations, and Use
- Phase Identification from sub 200 nm particles by electron backscatter diffraction (EBSD)
- Development of Single Particle Radioactivity Measurements
- Certification of SRM 2806, RM 8631, and RM 8632: Contamination Reference Materials for the Fluid Power Industry (see also our standards page)

Carbon Measurements on Bulk Particulate Samples

- Isotopic black carbon in the environment: new metrology for 14C and its international impact
- Standard Materials for the Federal Particulate Matter Research Program
- Sampling and Measurement of Atmospheric Aerosol Carbon from Forest Fires
- Radiocarbon measurements in support of the Northern Front Range Air Quality Study
- Nature and distribution of the blank: impact on low-level and high accuracy chemical metrology
- Resuspension of urban dust for production of a PM2.5 filter reference material

Selected Links

Inside NIST

- Ask an Expert
- Analytical Chemistry Division (839)
- Physical and Chemical Properties Division (838)
- Process Measurements Division (836)
- Building and Fire Research Laboratory
- Standard Reference Material Program

Outside NIST

- Inventory of Federal PM Research
- Environmental Protection Agency
- EPA Libby Asbestos Home Page
- NARSTO
- IAEA Compilation - Natural Matrix Reference Materials
- NFRAQS - Northern Front Range Air Quality Study
- NWT International Crown Fire Modelling Experiment (ICFME)

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