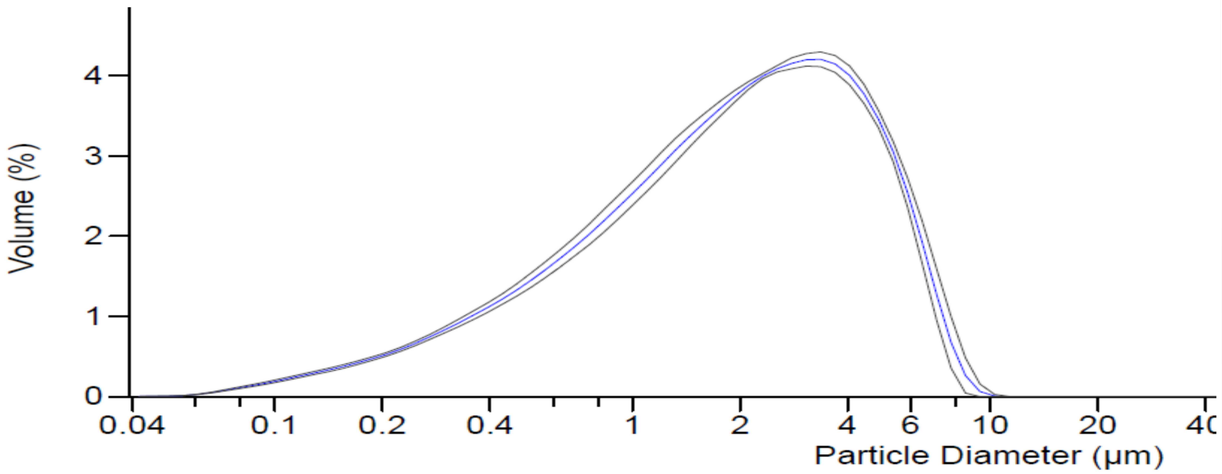
SAND2019-13713D

Particle Morphology

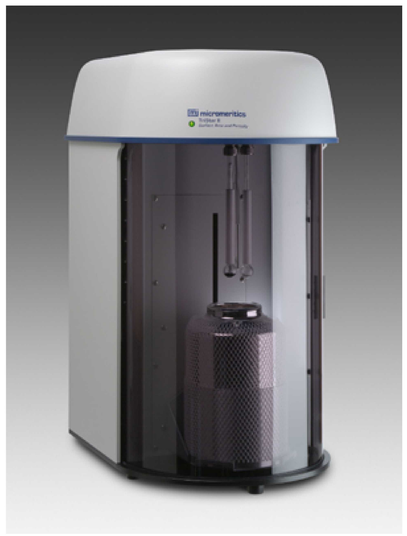
Laser-light Scattering Particle Size

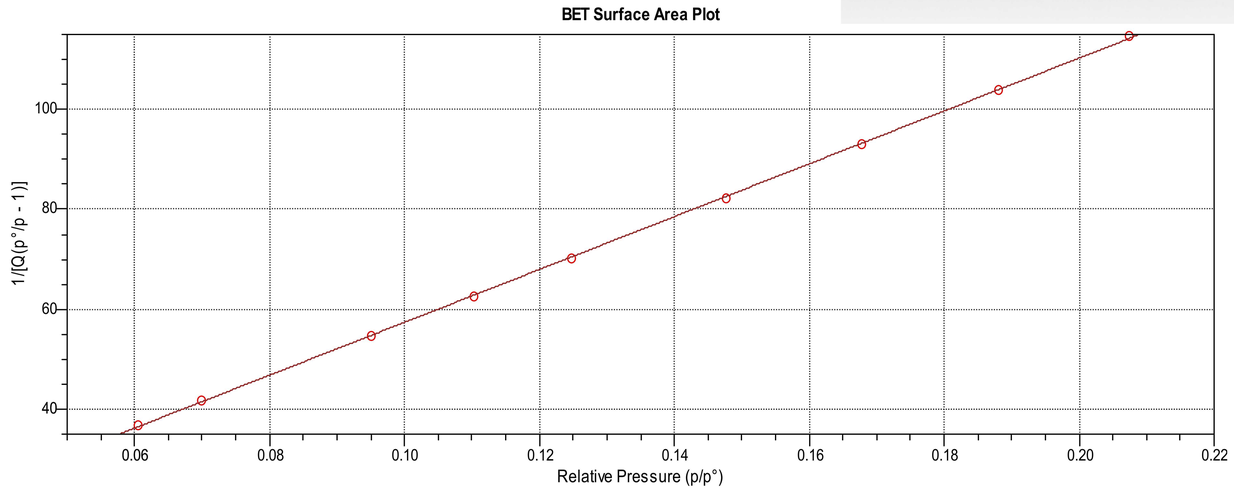
- Powders analyzed from 0.04 to 2000 microns
- Two analyzers: Microtrac S3500 and Coulter LS13320
  – Results in volume fractions, typically



BET (Brunauer Emmett Teller) S.A.

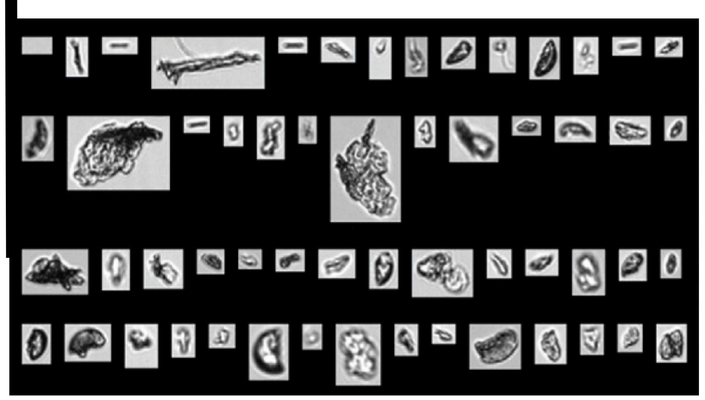
- Surface area measurements on powder samples – 3 at a time
- Non-destructive test allows for sample reclamation





FlowCam: Particle Imaging and Measurement System

- Particles imaged and sorted *via* a camera and light
- Allows visual and statistical sorting of particles by size, shape, opacity, and more!
- Uses very small (1mg) amounts of sample



Summary of Impact:

- Particle size and surface area directly affect energetic material performance: speed (timing) and output
- Production: specifications call out particle criteria
- Surveillance: size and morphology may change with time or environmental factors
- As new materials and classes of devices are made, factors must be checked to ensure process controls

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