Carbon Fiber Manufacturing

**Properties**
- ¼ the density of steel
- 5-10 times the specific strength of steel
- Reinforcement material in composites
- Currently, only ~10% of the theoretical tensile strength has been realized

**Applications**
- Carbon fiber
- Polymer fiber
- Nanocomposites
- Activated carbon
- Multifunctional materials

**High Performance Materials**
- Mechanical properties
- Electrical conductivity
- High surface area
- Microwave-assisted heating
- Low density materials

**Research Facilities**

Over 4,000 sq. ft. of class 1,000 cleanroom space for precursor fiber processing and carbonization.
- Single filament line and batch carbonization ovens
- Multifilament line (pilot-scale) and continuous carbonization ovens.

Part of PRIME LAB:
- Injection molding
- Micro-compounder
- Mini-compounder
- Pelletizer

In-house characterization capabilities:
- Tensile testing
- Thermal analysis (DSC, TGA, DMA)
- Solution rheology (parallel plate, cone/plate)
- Chemical analysis (FT-IR, Raman)
- Dynamic light scattering
- Four-point probe electrical conductivity
- Wide-angle X-ray diffraction (WAXD)
- BET surface area measurement

Graphitic structure (and properties) are being engineered by using nanofillers.

High surface area carbon with a surface area of 3550 m²/g is synthesized via low-cost, scalable process from polyacrylonitrile.