NETL ENERGY INNOVATIONS

Reaction Analysis and Chemical Transformation (ReACT) Facility

State-of-the-art (>6000 sq ft) laboratory to provide broad programmatic bench-scale chemical reactor R&D support with a focus on transformative chemical reaction science.

Left, a continuous variable frequency microwave reactor (frequency 2-8 GHz, power 0.6kW). Right, high-pressure (36 bar) microwave reactor (2.45 GHz, and 3 kW).

With the ReACT facility, NETL is pushing the boundaries of research in reaction science. The facility enables researchers to advance the science needed to optimize energy conversion and transform how we think about and approach chemical reactions. This includes investigating novel approaches using electromagnetic energy, such as microwaves, to selectively energize chemical reactions. No other known facility in the world has this unique set of capabilities.

NETL's ReACT facility:

- Houses multiple state-of-the-art microwave reactor systems.
- Builds upon NETL successes in developing a wide range of transformational energy technologies like low-pressure microwave-assisted ammonia synthesis, hydrogen production from waste feedstocks, etc.
- Is "fuel flexible" and able to experiment with solid feedstocks (waste plastics, municipal solid waste, coal, biomass, or mixtures of those), gaseous feedstocks (natural gas, syngas, ammonia, CO_2), liquid feedstocks (diesel, ethanol, etc.) under a range of pressures.
- Is equipped with advanced characterization capabilities important for developing efficient energy systems to meet changing needs and demands.