

Organic Energetics
An Integrated Biomass Conversion Technology
Energy, Chemicals and Small Aggregate, Syngas

Overview

The proprietary Rutgers process details a plant to transform low value organic waste from agricultural, domestic, and industrial sources into high value heat, electricity, and marketable chemicals, aggregates and fuels. Organic Energetics (OE) builds on the anaerobic digestion of organics to close the loop, environmentally, for the sequestration of pharmaceuticals, including antibiotics and hormones from soil, surface and groundwater systems. The process goes further by harvesting ammonia, potable water, and a variety of marketable biogases including, but not limited to methane, carbon dioxide and hydrogen. Immiscible polymer blends are an enabling part of this technology with regard to separation of product gases.

Progress

An important feature of the process includes the low cost separation of biogas constituents using immiscible polymer blend (IMPB) technology membranes. The membranes are being refined, characterized and analyzed for individual gas specificity for a variety of separation scenarios. The immediate analyses include separations of methane and carbon dioxide constituents of biogas from the anaerobic digestion phase, and syngas components from the combustion phase of OE.

Research results from individual phases of the OE process conducted in New Jersey, Maryland and Denmark have been successful and have exceeded expectation. With a sufficient funding scheme, the next phase of research will integrate the phases into a single-train demonstration facility. Research results project that this process could be the least expensive, and most environmentally benign method for the production of hydrogen and fuels from non-fossil substrates.

For a more detailed look at AMIPP's sheet and membrane technology refer to the project on gas separation membranes under the Industrial Technologies group.