

Disadvantages of biological conversion of biomass

- Slower rates than those of thermochemical processes
- Separation – distillation of ethanol

BIOGAS PRODUCTION

Biogas, approximately 50 vol% each of methane (CH₄) and carbon dioxide (CO₂), is produced by the decay of various forms of wet biomass in the absence of air (known as anaerobic digestion).

Biogas can be generated from animal and human wastes, sewage sludge, and crop residue. By-products of biomass production include a nitrogen-rich sludge that can be used as fertilizer. Biogas is produced extensively in China and India. It is estimated that there are millions of small digesters (biogas producers) in these two countries.

Biogas is also generated in more industrialized countries where perhaps 5,000 digesters are used to process animal wastes from stockyards and sewage from municipalities. Major goals in the operation of biogas producers are waste management and fertilizer generation. Digesters for biogas production operate at 35 – 55 ° C.

Liquid Fuels for Aviation Purposes

Most modern large-capacity aircraft are powered with gas turbines via jet propulsion that require distinct fuels with special properties. Most of the much smaller aircraft are still powered by piston-type spark ignition engines.

Accordingly, there are two main classes of fuels to power modern aircraft: aviation gasoline (avgas) and aviation turbine jet fuels.

Avgas is high octane number gasoline in piston type spark ignition engines.

Aviation fuels are an important class of liquid fuels derived from the refining of petroleum. Aviation jet fuels are based on the kerosene family and have properties ranging between those for gasoline and diesel fuels.

Jet fuel needs to flow at all operating conditions and temperatures. The fuel must stay liquid and must not freeze over the expected operating temperature ranges.

Typical additives to jet fuels are system corrosion inhibitors, thermal stability improvers, antioxidants, metal deactivators, lubricity improvers, leak detectors, and biocides. Additives to render jet fuels clean from the action of solid particulates and water are needed because water freezes at low temperatures and may cause corrosion.

Also, water in the fuel permits microbial and fungal growth that can generate acidic compounds that cause corrosion and generate growths that can clog fuel filters, especially in inactive military aircraft during periods of peace.