Claims

1. A method comprising:

saccharifying a lignocellulosic material that has been exposed to an electron beam at a dose rate of about 1 Mrad/s to about 10 Mrad/s to produce a sugar by contacting the lignocellulosic material with one or more one or more microorganisms and/or enzymes, and converting the sugar to a hydrocarbon by fermenting the sugar utilizing one or more thermophilic microorganism(s) wherein irradiating comprises applying to the material a total dose of between about 20 MRads and about 50 MRads.

2. The method of claim 1 wherein the one or more thermophilic microorganism(s) comprise a thermophilic bacterium.

3. The method of claim 1 wherein the lignocellulosic material is selected from the group consisting of wood, particle board, sawdust, agricultural waste, sewage, silage, grasses, rice hulls, bagasse, cotton, jute, hemp, flax, bamboo, sisal, abaca, straw, corn cobs, corn stover, switchgrass, alfalfa, hay, coconut hair, seaweed, algae, and mixtures thereof.

4. The method of claim 1 wherein the sugar is selected from the group consisting of glucose, xylose, arabinose, mannose, galactose, and mixtures thereof.

5. The method of claim 1 wherein the electron beam device delivers electrons having an energy of 0.3 MeV to about 2.0 MeV.

6. The method of claim 1, further comprising comminuting the lignocellulosic material.

7. The method of claim 1 wherein the hydrocarbon is selected from the group

consisting of methane, ethane, propane, pentane, n-hexane, and combinations thereof.

8. The method of claim 1 wherein converting further comprises gasification.