

What is claimed is:

1. A method for processing a biocomponent feedstock, comprising:
 - exposing a feedstock comprising at least about 25 wt % triglycerides to a first catalyst in the presence of hydrogen under effective deoxygenation conditions for forming an at least partially deoxygenated effluent, the at least partially deoxygenated effluent having at least about 40 wt % of olefins and having an oxygen content that is at least 40% less than an oxygen content of the feedstock, the first catalyst comprising a supported Group VI metal catalyst or a supported Group VIII non-noble metal catalyst;
 - separating the at least partially deoxygenated effluent to form a gas phase effluent and a liquid phase effluent, the liquid phase effluent comprising at least 15 wt % olefins;
 - exposing the liquid phase effluent to an acidic catalyst under effective conditions for oligomerization of at least a portion of the olefins to form a product effluent; and
 - fractioning at least a portion of the product effluent to form a diesel product fraction, the diesel product fraction having an olefin to paraffin ratio of at least about 0.04.
2. A method for processing a biocomponent feedstock, comprising:
 - exposing a feedstock comprising at least about 25 wt % triglycerides to a first catalyst in the presence of hydrogen under effective deoxygenation conditions for forming an at least partially deoxygenated effluent, the at least partially deoxygenated effluent having at least about 40 wt % of olefins and having an oxygen content that is at least 40% less than an oxygen content of the feedstock, the first catalyst comprising a supported Group VI metal catalyst or a supported Group VIII non-noble metal catalyst;
 - separating the at least partially deoxygenated effluent to form a gas phase effluent and a liquid phase effluent, the liquid phase effluent comprising at least 15 wt % olefins;

exposing the liquid phase effluent to an acidic catalyst under effective conditions for oligomerization of at least a portion of the olefins to form a product effluent; and

fractioning at least a portion of the liquid phase effluent to form a diesel product fraction, the diesel product fraction having an olefin to paraffin ratio of at least about 0.04.

3. The method of claim 1 or 2, wherein the feedstock comprises at least 40 wt % of triglycerides.

4. The method of claim 1 or 2, wherein the liquid phase effluent has an olefin to paraffin ratio of at least about 0.06.

5. The method of claim 1 or 2, wherein the effective deoxygenation conditions include a temperature from about 250°C to about 350°C, an LHSV from about 0.2 hr⁻¹ to about 10 hr⁻¹, and a hydrogen partial pressure of about 200 psig (1.4 MPag) to about 2000 psig (14 MPag).

6. The method of claim 1 or 2, wherein the acidic catalyst comprises MCM-49, MCM-56, zeolite USY, montmorillonite, an acidic clay, sulfated ZrO₂, tungsten, or a combination thereof, the acidic catalyst optionally being a supported catalyst.

7. The method of claim 1 or 2, further comprising:
hydrotreating at least a portion of the product effluent under effective hydrotreating conditions to produce a hydrotreated product effluent; and
exposing at least a portion of the hydrotreated product effluent to a dewaxing catalyst under effective dewaxing conditions.

8. The method of claim 1 or 2, wherein the first catalyst comprises tungsten, molybdenum or cobalt.

9. The method of claim 1 or 2 wherein the first catalyst consists essentially of a Group VI metal catalyst or a Group VIII non-noble metal catalyst.

10. The method of claim 1 or 2, wherein the first catalyst consist essentially of a Group VI metal catalyst with a physical promoter metal or a Group VIII non-noble metal catalyst with a physical promoter metal.

11. The method of claim 1 or 2, wherein the first catalyst comprises zinc and molybdenum, zinc and tungsten, magnesium and molybdenum, or magnesium and tungsten.

12. The method of claim 1 or 2, wherein the feedstock comprises from about 10 wt % to about 50 wt % of a recycle feed, the recycle feed corresponding to a recycled portion of at least one of the liquid phase effluent or the diesel product fraction.

13. The method of claim 1 or 2, wherein the at least partially deoxygenated effluent has an oxygen content of about 1.0 wt % or less.