What is claimed is

1. A method, comprising:

size reducing a starting lignocellulosic biomass to form a lignocellulosic biomass having a particle size less than about 500 μm;

forming a mixture comprising:

water; and

said lignocellulosic biomass having a particle size less than about 500 μm; and

contacting water at a temperature of at least about 375 °C and a pressure of at least about 221 bar with said mixture for a duration sufficient to produce at least one C_5 or C_6 saccharide;

wherein said mixture is substantially free of exogenous acid.

2. The method of claim 1,

wherein said size reducing comprises steam exploding said starting lignocellulosic biomass in the presence of ammonia.

3. The method of claim 1,

wherein said size reducing comprises steam exploding said starting lignocellulosic biomass in the presence of sulfur dioxide.

4. The method of claim 1,

wherein said lignocellulosic biomass is derived from thermally processed cellulosic biomass.

5. The method of claim 1,

wherein said lignocellulosic biomass is derived from chemically processed cellulosic biomass.

6. The method of claim 1,

wherein said lignocellulosic biomass is derived from agricultural residue, waste lignocellulosic biomass, or a combination thereof.

7. The method of claim 1,

wherein said lignocellulosic biomass has a particle size of about 10 µm to about 300 µm.

8. The method of claim 1,

wherein said C_5 or C_6 saccharide is a C_5 monosaccharide, and said C_5 monosaccharide is xylose.

9. The method of claim 1,

wherein said C_5 or C_6 saccharide is a C_6 monosaccharide, and said C_6 monosaccharide is glucose.

10. The method of claim 1,

wherein said C_5 or C_6 saccharide is a C_6 monosaccharide, and said C_6 monosaccharide is mannose.

11. The method of claim 1, further comprising:

heating said mixture to a temperature of at least about 150 °C subsequent to said size reducing step and prior to said contacting step.

12. The method of claim 1, further comprising:

fermenting at least one of said C_5 and C_6 saccharide using an oligomer fermenter.

13. The method of claim 1, further comprising:

recovering at least one component released into a gas phase, wherein said component is acetic acid.

14. The method of claim 1,

wherein said duration is about 2 seconds or less.

15. The method of claim 1,

wherein at least a portion of said method employs a digester.

16. The method of claim 15,

wherein said size reducing comprises steam exploding said starting lignocellulosic biomass.

17. The method of claim 1,

wherein said starting lignocellulosic biomass is obtained from treatment of biomass in a digester.

18. The method of claim 17,

wherein said size reducing comprises steam exploding said starting lignocellulosic biomass.

19. The method of claim 1,

wherein said water in said contacting is at a temperature of about 390 °C to about 470 °C and a pressure of at least about 225 bar.

20. The method of claim 1,

wherein said mixture prior to said contacting has a solids content of about 10 wt.% to about 35 wt.%.