WHAT IS CLAIMED IS:

1. A process for the production of a product comprising 5-(hydroxymethyl)furfural (HMF) and water, the process comprising:

combining fructose, water, a homogeneous acid catalyst and at least a first solvent in one or more reaction zones;

converting in the one or more reaction zones a portion of the fructose to HMF and water;

removing from at least one of the reaction zones a combination comprising at least a portion of the HMF, humins, homogeneous acid catalyst and first solvent;

neutralizing the homogeneous acid catalyst by addition of a base to the combination; and

contacting the neutralized combination with one or more selective membranes to produce a retentate comprising humins and a permeate depleted in humins and comprising HMF.

2. The process of claim 1 wherein the combination further comprises unconverted fructose and intermediates to HMF, the retentate further comprises unconverted fructose and intermediates and the permeate is depleted in unconverted fructose and intermediates.

3. The process of claim 1 wherein the one or more selective membranes are selected from ultra-filtration membranes, nano-filtration membranes, and combinations thereof.

4. The process of claim 3 wherein the one or more selective membranes comprises ultra-filtration membranes.

5. The process of claim 1 wherein the solids content of the combination withdrawn from the reaction zone is reduced prior to contacting the combination with one or more selective membranes.

6. The process of claim 5 wherein the solids content of the combination withdrawn from the reaction zone is reduced by dilution with an aqueous diluent.

7. The process of claim 5 wherein the solids content of the combination withdrawn from the reaction zone is reduced by filtration.

8. The process of claim 5 wherein the solids content of the combination withdrawn from the reaction zone is reduced to less than about 1000 ppm.

9. The process of claim 1 wherein the one or more selective membranes are in a cross-flow arrangement.

10. The process of claim 1 wherein the one or more selective membranes are in a single pass system.

11. The process of claim 1 wherein the one or more selective membranes are in a multi-pass system.

12. The process of claim 1 wherein the one or more selective membranes have a geometry selected from the group consisting of flat, tubular, capillary, and spiral-wound.

13. The process of claim 1 wherein the homogenous acid catalyst is selected from the group consisting of mineral acids, organic acids, and combinations thereof.

14. The process of claim 13 wherein the homogenous acid catalyst is selected from the group consisting of HCl, HBr, HI, H_2SO_4, HNO_3, H_3PO_4, oxalic acid, CF_3SO_3H, CH_3SO_3H, borontrihalides, and combinations thereof.

15. The process of claim 14 wherein the homogenous acid catalyst is selected from the group consisting of HCl, HBr, H_2SO_4, H_3PO_4, and combinations thereof.

16. The process of claim 15 wherein the acid catalyst comprises HBr.

17. The process of claim 1 wherein the combination is mono-phasic.

18. A process for the production of a product comprising 5-(hydroxymethyl)furfural (HMF) and water, the process comprising:

combining fructose, water, an acid catalyst and at least a first solvent in one or more reaction zones;

converting in the one or more reaction zones a portion of the fructose to HMF and water and to intermediates to HMF;

removing from at least one of the reaction zones a combination comprising at least a portion of the HMF, unconverted fructose, intermediates, humins, and first solvent,

contacting the combination with one or more ultra-filtration membranes to produce a retentate comprising humins and a permeate depleted in humins that comprises unconverted fructose, intermediates, HMF, first solvent, and water; and

contacting the ultra-filtration permeate with one or more nano-filtration membranes to produce a retentate comprising unconverted fructose and a permeate substantially free of unconverted fructose and comprising HMF.