SUMMARY OF THE INVENTION

In one embodiment, the present invention provides a process for making an aliphatic ketone or a mixture of aliphatic ketones having about 14 to 52 carbon atoms, comprising: reaction of a fatty acid in a vapor phase with a decarboxylation-coupling catalyst in a decarboxylation-coupling zone, wherein a decarboxylation-coupling zone temperature is between about 20°C to 100°C above the condensation point of the fatty acid at the partial pressure of the fatty acid in the decarboxylation-coupling zone.

In yet another embodiment, the present invention provides a process for making an aliphatic ketone or a mixture of aliphatic ketones having about 14 to 52 carbon atoms, comprising: reaction of a fatty acid in a vapor phase with a decarboxylation-coupling catalyst in a decarboxylation-coupling zone, wherein a partial pressure of the fatty acid is between about 1% to 90% of the partial pressure at the condensation point at a given decarboxylation-coupling zone temperature.

In yet another embodiment, the present invention provides a process for making an aliphatic ketone or a mixture of aliphatic ketones having about 14 to 52 carbon atoms from a fatty acid feed(stock), comprising: reaction of a fatty acid in a vapor phase with a decarboxylation-coupling catalyst in a decarboxylation-coupling zone, wherein a decarboxylation-coupling zone temperature is between about 20°C to 100°C above the condensation point of the fatty acid at the partial pressure of the fatty acid in the decarboxylation-coupling zone.

In yet another embodiment, the present invention provides a process for making an aliphatic ketone or a mixture of aliphatic ketones having about 14 to 52 carbon atoms from a fatty acid feed(stock), comprising: reaction of a fatty acid in a vapor phase with a decarboxylation-coupling catalyst in a decarboxylation-coupling zone, wherein a partial pressure of the fatty acid is between 1% and 90% of the partial pressure at the condensation point at a given decarboxylation-coupling zone temperature.

DETAILED DESCRIPTION OF THE INVENTION

In some embodiments, the present invention provides a process for making an aliphatic ketone or a mixture of aliphatic ketones having about 20 to 48 carbon atoms.

In some embodiments, the present invention provides a process for making an aliphatic ketone or a mixture of aliphatic ketones having 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48 carbon atoms, and combinations thereof.

In some embodiments, the decarboxylation-coupling zone temperature is between about 20°C to 75°C above the condensation point of the fatty acid at the partial pressure of the fatty acid in the decarboxylation-coupling zone.

In some embodiments, the decarboxylation-coupling zone temperature is at least about 20°C, 25°C, 30°C, 35°C, 40°C, 45°C, 50°C, 55°C, 60°C or 65°C above the condensation point of the fatty acid at the partial pressure of the fatty acid in the decarboxylation-coupling zone.

In some embodiments, the decarboxylation-coupling zone temperature is at least about 27°C above the condensation point of the fatty acid at the partial pressure of the fatty acid in the decarboxylation-coupling zone.

In some embodiments, the decarboxylation-coupling zone pressure is between about 200 psia to 1 psia.

Claims

1. A process for making an aliphatic ketone or a mixture of aliphatic ketones having about 14 to 52 carbon atoms from a fatty acid feed(stock), comprising: reaction of a fatty acid in a vapor phase with a decarboxylation-coupling catalyst in a decarboxylation-coupling zone, wherein a decarboxylation-coupling zone temperature is between about 20°C to 100°C above the condensation point of the fatty acid at the partial pressure of the fatty acid in the decarboxylation-coupling zone.

2. The process of Claim 1, wherein the decarboxylation-coupling zone temperature is at least about 20°C, 25°C, 30°C, 35°C, 40°C, 45°C, 50°C, 55°C, 60°C or 65°C above the condensation point at the partial pressure of the fatty acid in the decarboxylation-coupling zone.

3. The process of Claim 1, wherein the partial pressure of the fatty acid is between about 75 psia to 1 psia.

4. A process for making an aliphatic ketone or a mixture of aliphatic ketones having about 14 to 52 carbon atoms from a fatty acid feed(stock), comprising: reaction of a fatty acid in a vapor phase with a decarboxylation-coupling catalyst in a decarboxylation-coupling zone, wherein a partial pressure of the fatty acid is between 1% and 90% of the partial pressure at the condensation point at a given decarboxylation-coupling zone temperature.

5. The process of Claim 4, wherein the decarboxylation-coupling zone temperature is between about 100°C to 500°C.

6. The process of Claim 4, wherein the partial pressure of the fatty acid is no more than 90%, 75%, 50%, 25%, 10%, 5% or 2% of the partial pressure at the condensation point at the given decarboxylation-coupling zone temperature.

7. The process of Claim 1 or 4, wherein the partial pressure of the fatty acid is lowered relative to the pressure in the decarboxylation-coupling zone by the addition of an inert diluent selected from the group consisting of nitrogen, hydrogen, carbon monoxide, water, carbon dioxide, C_1-C_{18} aliphatic hydrocarbon, and mixtures thereof.