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(54) **DEOXYGENATION OF FATTY ACIDS FOR PREPARATION OF HYDROCARBONS**

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See application file for complete search history.

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(57) **ABSTRACT**

Embodiments of methods for making renewable diesel by deoxygenating (decarboxylating/decarbonylating/dehydrating) fatty acids to produce hydrocarbons are disclosed. Fatty acids are exposed to a catalyst selected from a) Pt and MO_3 on ZrO_2 (M is W, Mo, or a combination thereof), or b) Pt/Ge or Pt/Sn on carbon, and the catalyst decarboxylates at least 10% of the fatty acids. In particular embodiments, the catalyst consists essentially of 0.7 wt % Pt and 12 wt % WO_3, relative to a mass of catalyst, or the catalyst consists essentially of a) 5 wt % Pt and b) 0.5 wt % Ge or 0.5 wt % Sn, relative to a mass of catalyst. Deoxygenation is performed without added hydrogen and at less than 100 psi. Disclosed embodiments of the catalysts deoxygenate at least 10% of fatty acids in a fatty acid feed, and remain capable of deoxygenating fatty acids for at least 200 minutes to more than 350 hours.

16 Claims, 31 Drawing Sheets