Summary

In a first aspect of the present disclosure, there is provided a process for conversion of a feedstock containing at least 5 wt%, 15 wt% or 30 wt% aromatics, originating from thermal decomposition of solids, comprising the steps of

a. directing the feedstock to contact a material catalytically active in hydrodeoxygenation under hydrodeoxygenation conditions in the presence of dihydrogen, to provide a deoxygenated intermediate,
b. separating from the deoxygenated intermediate a deoxygenated distillate fraction boiling above 150°C and
c. directing at least an amount of the deoxygenated distillate fraction to contact a material catalytically active in hydrodearomatization under hydrodearomatization conditions in the presence of dihydrogen, to provide an dearomatized intermediate.

In another aspect of the present disclosure, there is provided a process plant for conversion of a feedstock containing at least 5 wt% aromatics, originating from thermal decomposition of solids, comprising

a. a hydrodeoxygenation section containing a material catalytically active in hydrodeoxygenation operating under hydrodeoxygenation conditions in the presence of dihydrogen, having an inlet and an outlet,
b. a hydrodearomatization section containing a material catalytically active in hydrodearomatization operating under hydrodearomatization conditions in the presence of dihydrogen, having an inlet and an outlet,

wherein the outlet of the hydrodeoxygenation section is in fluid communication with the inlet of the hydrodearomatization section.

Description

One aspect of the present disclosure relates to a process for conversion of a feedstock containing at least 5 wt%, 15 wt% or 30 wt% aromatics, originating from thermal decomposition of solids, comprising the steps of directing the feedstock to contact a material catalytically active in hydrodeoxygenation under hydrodeoxygenation conditions in the presence of dihydrogen, to provide a deoxygenated intermediate, separating from the deoxygenated intermediate a deoxygenated distillate fraction boiling above 150°C and directing at least an amount of the deoxygenated intermediate to contact a material catalytically active in hydrodearomatization under hydrodearomatization conditions in the presence of dihydrogen, to provide an dearomatized intermediate.

This has the associated benefit of converting a feedstock such as pyrolysis oil to a product or an intermediate compatible with diesel fuel requirements with a minimal yield loss, low reactor volume and without sacrificing aromatics in the naphtha fraction. The hydrodearomatization process may be configured for reduced the aromatic content to below 10 wt%, 5 wt % or 2 wt%, but above 0.1 wt%.

A further aspect of the present disclosure relates to a process for conversion of a feedstock containing at least 5 wt% aromatics, originating from thermal decomposition of solids, comprising the steps of directing the feedstock to contact a material catalytically active in hydrodeoxygenation under hydrodeoxygenation conditions in the presence of dihydrogen, to provide a deoxygenated intermediate and directing at least an amount of the deoxygenated intermediate to contact a material catalytically active in hydrodearomatization under hydrodearomatization conditions in the presence of dihydrogen, to provide an dearomatized intermediate.

In a further embodiment the process further comprises directing an unstabilized feedstock originating from thermal decomposition of solids, to contact a material catalytically active in hydrotreatment under pretreatment conditions in the presence of dihydrogen, to provide said composition originating from thermal decomposition of solids.

This has the associated benefit of stabilizing an unstabilized feedstock for further processing, minimizing the risk of pipe and reactor blocking and minimizing the risk of catalyst deactivation.