process. Since in most instances these are undesired, and often difficult to separate from the desired linear alpha-olefins, minimization of these byproducts is sought. Small, U.S. Patent No. 6,911,505 discloses processes for the production of alpha-olefins, including dimerization and isomerization of olefins using a cobalt catalyst complex are provided herein. The olefins so produced are described in this patent as being useful as monomers in further polymerization reactions and useful as chemical intermediates.

Eaton, et al., U.S. Patent No. 6730750, is directed to improved drag reducing agents and methods of forming improved drag reducing agents comprising the steps of isomerizing olefin monomers to form isomerized olefin monomers, polymerizing the isomerized olefin monomers in the presence of at least one catalyst to form a polyolefin drag reducing agent having unexpectedly superior drag reduction properties when combined with liquid hydrocarbons, such as viscous crude oil. This patent further discloses that the drag reducing agents may be introduced into conduits, such as pipelines, to increase the flow of the hydrocarbons through the conduit.

SUMMARY OF THE DISCLOSURE~~INVENTION~~

The present disclosure~~invention~~ is directed to an isomerized alpha olefin sulfonate. The present disclosure~~invention~~ is also directed to a method of making the isomerized alpha olefin sulfonate.

In one embodiment, the present disclosure~~invention~~ is directed to an isomerized alpha olefin sulfonate having the general formula:

$R\text{-}SO_3\ M$

wherein R is an aliphatic hydrocarbyl group having from about 12 to about 40 carbon atoms, having from about 20 to 98 weight percent branching, and containing one or more olefin or alcohol moieties or mixtures thereof; and R is derived from a partially isomerized alpha olefin containing a residual alpha olefin content, wherein when the percent branching in the partially isomerized alpha olefin is less than or equal to 25

weight percent, then the residual alpha olefin content in such partially isomerized alpha olefin is greater than or equal to 8 weight percent; and M is a mono-valent cation.

In one embodiment, there is provided an isomerized alpha olefin sulfonate having the general formula:

$$R\text{-}SO_3\ M$$

wherein R is an aliphatic hydrocarbyl group having from 12 to 40 carbon atoms, having from 20 to 98 weight percent branching, and containing one or more olefin or alcohol moieties or mixtures thereof; and R is derived from a partially isomerized alpha olefin containing a residual alpha olefin content, and M is a mono-valent cation wherein

(i) when the percent branching in the partially isomerized alpha olefin is less than or equal to 25 weight percent, then the residual alpha olefin content in such partially isomerized alpha olefin is greater than or equal to 8 weight percent; or

(ii) if the percent branching in the partially isomerized alpha olefin is greater than or equal to 15 weight percent, then the residual alpha olefin content in such partially isomerized alpha olefin is less than or equal to 15 weight percent and wherein if the percent branching in the partially isomerized alpha olefin is less than or equal to 15 weight percent, then the residual alpha olefin content in such partially isomerized alpha olefin is greater than or equal to 15 weight percent.

In one embodiment, the present disclosure~~invention~~ is directed to a method of making an isomerized alpha olefin sulfonate comprising the steps of

(a) sulfonating an isomerized alpha olefin with sulfur trioxide in the presence of air thereby producing primarily an isomerized alpha olefin sulfonic acid, wherein the isomerized alpha olefin is derived from the isomerization of C_{12}-C_{40} normal alpha olefins;

(b) optionally thermally digesting the product from step (a);

(c) neutralizing the product from step (b) with a source of alkali or alkaline earth metal or amines such as ammonia; and

(d) optionally, hydrolyzing the product from step (c) with additional base or caustic.

In one embodiment, there is provided a method of making an isomerized alpha olefin sulfonate comprising the steps of (a) sulfonating an isomerized alpha olefin with sulfur trioxide in the presence of air thereby producing primarily an isomerized alpha olefin sulfonic acid, wherein the isomerized alpha olefin is derived from the isomerization of C_{12}-C_{40} normal alpha olefins; (b) optionally thermally digesting the product from step (a); (c) neutralizing the product from step (b) with a source of a mono-valent cation; and (d) optionally, hydrolyzing the product from step (c) with additional base or caustic; wherein the isomerized alpha olefin has from 12 to 40 carbon atoms, and from 20 to 98 weight percent branching; and comprises a partially isomerized alpha olefin containing a residual alpha olefin content, wherein when the percent branching in the partially isomerized alpha olefin is less than or equal to 25 weight percent, then the residual alpha olefin content in such partially isomerized alpha olefin is greater than or equal to 8 weight percent.

In one embodiment, the present disclosure~~invention~~ is directed to an isomerized alpha olefin sulfonate having the general formula:

$R\text{-}SO_3\ M$

wherein R is an aliphatic hydrocarbyl group having from about 12 to about 40 carbon atoms, having from about 20 to 98 weight percent branching, and containing one or more olefin or alcohol moieties or mixtures thereof; R is derived from a partially isomerized alpha olefin containing a residual alpha olefin content, wherein if the percent branching in the partially isomerized alpha olefin is greater than or equal to 15 weight percent, then the residual alpha olefin content in such partially isomerized alpha olefin is less than or