REMOVAL OF VANADIUM AND/OR SODIUM FROM PETROLEUM AND PETROLEUM PRODUCTS WITH TITANIA ON ALUMINA AND HYDROTREATING

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3 Claims. (Cl. 196—24)

This invention relates to a process for reducing the content of vanadium and/or sodium in petroleum and petroleum products.

In the complete specification of the co-pending application Ser. No. 1,029/51 there was described a process in which the content of vanadium and/or sodium in petroleum or petroleum products is reduced by contact with bauxite in the presence or absence of hydrogen and under conditions of temperature and pressure such that vanadium and/or sodium are deposited on or incorporated with the bauxite. It was later discovered that the degree of vanadium and/or sodium removal under any given set of operating conditions tended to vary with bauxites of different origins.

It has now been found that the content of vanadium and/or sodium in petroleum or petroleum products can be reduced by treatment with titan alumina.

According to the invention therefore, a process for reducing the content of vanadium and/or sodium in crude petroleum or a petroleum product comprises contacting the crude petroleum or petroleum product with a contact material consisting essentially of titan alumina, in the presence of hydrogen and under conditions of temperature and pressure such that vanadium and/or sodium are deposited on the contact material.

The contact material preferably contains from 1—10% by weight of TiO₂ the remainder consisting essentially of alumina.

The preferred ranges of operating conditions for the process are as follows:

Space velocity 0.5 to 2.0 v./v. hr
Temperature 750° to 800° F
Pressure 500 to 1,500 p. i. ga
Hydrogen recycle rate 1,000 to 10,000 S. C. F./B. per hour

The process of the invention is particularly adaptable as a pre-treatment process for crude petroleum or petroleum products which are to be passed to a catalytic hydrogenation process for the removal of organically combined sulphur. For example, it has been found that in the hydrogenation of crude petroleum and petroleum residues using a catalyst consisting of cobalt and molybdenum oxides supported on alumina, substantial propor-

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Sodium and vanadium removal from Kuwait 53% vol. residue.

Results obtained: Titan alumina (4.70 wt. TiO₂).

We claim:
1. A process for reducing the content of vanadium and sodium in a petroleum feedstock, comprising contacting the petroleum feedstock with a contact material consisting essentially of titan alumina, in the presence of hydrogen at a temperature within the range 750°—800° F. and at a pressure within the range 500—1500 p. i. ga. whereby vanadium and sodium are deposited on the contact material.
2. A process according to claim 1, wherein the contact material contains from 1—10% by weight of TiO₂, the remainder consisting essentially of alumina.
3. A process according to claim 1, wherein the treated feedstock is subsequently passed to a hydrogenation zone for the removal of organically combined sulphur.

References Cited in the file of this patent

UNITED STATES PATENTS
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