Title (en)

Immobilisation of vanadia deposited on catalytic materials during the conversion of oil that contains coke precursors and heavy metals.

Title (de)

Immobilisierung von Vanadinoxid, das bei der Umwandlung von Koksvorläufer und Schwermetalle enthaltenden Ölen auf Katalysatoren abgelagert wurde.

Title (fr)

Immobilisation d'oxyde de vanadium déposé sur des catalyseurs pendant la conversion d'huiles contenant des précurseurs de coke et des métaux lourds.

Publication

EP 0073874 A1 19830316 (EN)

Application

EP 82101625 A 19820303

Priority

- US 8100356 W 19810319
- US 27775181 A 19810330

Abstract (en)

Crude oils or residual fractions from the distillation of petroleum containing substantial amount of metals such as Ni, V, Fe, Cu, Na and high Conradson carbon values are converted to liquid transportation and distillate heating fuels by contacting with a zeolitic containing catalyst containing a metal additive to immobilize the vanadium oxides deposited on the catalyst. As the vanadium oxide level builds up on the catalyst, the elevated temperatures encountered in the regeneration zone cause the vanadia to melt and liquid vanadia to flow. Among other things this vanadia enters the zeolite structure leading to neutralization of acid sites and more significantly to irreversible destruction of the crystalline structure to less active amorphous material (see attached graphs). In addition this melting and flowing of vanadia can, at high levels and for materials with low surface area, also coat the outside of the microscope with liquid, thereby causing coalescence between catalyst particles adversely affecting its fluidization properties. The select metal additives of this invention were chosen so as to form compounds or complexes with vanadia which have melting points above the temperatures encountered in the regeneration zone, thus avoiding zeolite destruction, surface sintering and particle fusion. These select additives were also chosen with a view of immobilizing vanadia while simultaneously avoiding neutralization of acidic sites. Many additional additives which do affect the melting point of vanadia were eliminated due to this negative effect on catalyst activity. Titania and zirconia, in combination with silica, are known to form acidic catalysts with cracking activity in their own right. Alkaline earth metals can be used to immobilize vanadia but are somewhat detrimental to acidic sites. Selection of additives to immobilize vanadia on RCC catalysts is much more confined in comparison but dealing with the same problem as vanadia deposited on sorbent materials. The method of addition of the metal additive can be during manufacture, after spray drying or at any point in the reduced crude processing cycle.

IPC 1-7

C10G 11/18; C10G 11/04; B01J 29/06; B01J 29/28

IPC 8 full level

C10G 11/04 (2006.01); **C10G 11/05** (2006.01); **C10G 11/18** (2006.01)

CPC (source: EP)

C10G 11/04 (2013.01); **C10G 11/05** (2013.01); **C10G 11/18** (2013.01)

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