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(54) Title: TWO-STAGE HYDROPROCESSING PROCESS AND CATALYST

(57) Abstract: The present invention pertains to a method for hydroprocessing a heavy hydrocarbon oil, comprising bringing a heavy hydrocarbon oil in a first stage into contact with hydroprocessing catalyst I in the presence of hydrogen, after which the effluent of the first stage is contacted in whole or in part with hydroprocessing catalyst II in the presence of hydrogen, wherein catalyst I comprises 7 to 20 wt. % of a Group VIB metal component, calculated as trioxide on the weight of the catalyst, and 0.5 to 6 wt.% of a Group VIII metal component, calculated as oxide on the weight of the catalyst, on a porous inorganic carrier, said catalyst having a specific surface area of at least 100 m²/g, a total pore volume of at least 0.55 ml/g, at least 50% of the total pore volume in pores with a diameter of at least 20 nm (200 Å) and at least 65% of the total pore volume in pores with a diameter of 10-120 nm (100-1200 Å), and catalyst II comprises 7 to 20 wt.% of a Group VIB metal component calculated as trioxide on the weight of the catalyst, and 0.5 to 6 wt.% of a Group VIII metal component, calculated as oxide on the weight of the catalyst, on a porous inorganic carrier, said catalyst having a specific surface area of at least 100 m²/g, a total pore volume of at least 0.55 ml/g, 30-80% of the pore volume in pores with a diameter of 10-20 nm (100-200 Å), and at least 5% of the pore volume in pores with a diameter of at least 100 nm (1000 Å) with catalyst I having a larger percentage of its pore volume in pores with a diameter of at least 20 nm (200 Å) than catalyst II. The method of the invention combines efficient contaminant removal with high residue conversion and low sediment formation.



WO 02/100985 A3