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ABSTRACT

Provided are a hydrogenation catalyst for hydrocarbon oil, having much improved desulfurization activity, denitrogenation activity and dearomatization activity; a carrier for the catalyst and its production; and a method of hydrogenation of hydrocarbon oil with the catalyst. The hydrogenation catalyst is produced by impregnating a refractory inorganic oxide carrier with a solution containing a water-soluble metal compound of Group 4 of the Periodic Table so that it carries the metal compound, then further impregnating with an aqueous solution containing at least one metal compound of Group 6 and at least one metal compound of Groups 8 to 10 of the Periodic Table so that it carries the metal compounds, and thereafter heating it at a temperature not higher than 300°C. The method for producing the hydrogenation catalyst comprises applying a water-soluble organic compound having a boiling point or a decomposition point of not lower than 150°C to a refractory inorganic oxide carrier, then applying thereto a metal compound of Group 4 of the Periodic Table, and thereafter further applying thereto at least one metal compound of Group 6 and at least one metal compound of Groups 8 to 10 of the Periodic Table; or comprises applying a metal compound of Group 4 of the Periodic Table to a refractory inorganic oxide carrier, along with a water-soluble organic compound having a boiling point or a decomposition point of not

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lower than 150°C thereto, and thereafter further applying thereto at least one metal compound of Group 6 and at least one metal compound of Groups 8 to 10 of the Periodic Table; or comprises applying at least one metal compound of Group 6 and at least one metal compound of Groups 8 to 10 of the Periodic Table to a refractory inorganic oxide carrier, along with a water-soluble organic compound having a boiling point or a decomposition point of not lower than 150°C thereto, and thereafter further applying thereto a metal compound of Group 4 of the Periodic Table. The carrier for the catalyst is a metal compound-loading refractory inorganic oxide carrier prepared by applying a metal compound to a refractory inorganic oxide carrier. In the carrier, the metal exists uniformly everywhere inside it.