

ABSTRACT

This catalyst of the present invention is a hydrodesulfurization catalyst that supports one or more metals selected from a group consisting of elements in Group 6 of the long period periodic table, one or more metals selected from a group consisting of elements in Group 9 or Group 10 of the same, phosphorus, and an organic acid on a composite oxide support having a specific content of both alumina and HY zeolite having a specific crystallite size and the like. The catalyst includes 10% by mass to 40% by mass of the Group 6 metal, 1% by mass to 15% by mass of the Group 9 or Group 10 metal, and 1.5% by mass to 8% by mass of phosphorus in terms of an oxide based on the catalyst. The catalyst includes 0.8% by mass to 7 % by mass of carbon derived from an organic acid and for 1 mole of the Group 9 element metal or Group 10 element metal in terms of an element based on the catalyst, and includes 0.2 moles to 1.2 moles of the organic acid. The specific surface area, pore volume, and average pore diameter in a pore distribution are within specific ranges.