

Abstract

Disclosed is a modified Y-type molecular sieve, its preparation and application thereof, the modified Y-type molecular sieve having a calcium content of about 0.3-4 wt% calculated on the basis of calcium oxide, a rare earth content of about 2-7 wt% calculated on the basis of rare earth oxide, and a sodium content of no more than about 0.5 wt% calculated on the basis of sodium oxide; wherein the modified Y-type molecular sieve has a total pore volume of about 0.33-0.39 ml/g, a proportion of the pore volume of secondary pores having a pore size of 2-100 nm to the total pore volume of about 10-25%, a lattice constant of about 2.440-2.455 nm, a proportion of non-framework aluminum content to the total aluminum content of no more than about 20%, a lattice collapse temperature of not lower than about 1050 °C, and a ratio of B acid to L acid in the total acid content of no less than about 2.30, as determined by pyridine adsorption infrared spectroscopy at 200 °C. When used for catalytic cracking of heavy oils, the modified Y-type molecular sieve and a catalytic cracking catalyst comprising the same show high heavy oil conversion activity and low coke selectivity, and can provide an improved yield of gasoline and branched C4-hydrocarbons, and an increased content of branched hydrocarbons in gasoline.