

Abstract

The invention relates to a molecular sieve of MFI structure rich in mesopores and a process of producing same, wherein the molecular sieve has a ratio of $n(\text{SiO}_2)/n(\text{Al}_2\text{O}_3)$ of more than 15 and less than 70; the molecular sieve has a content of phosphorus of 1-15 wt%, calculated as P_2O_5 and based on the dry weight of the molecular sieve; the content of the supported metal in the molecular sieve is 1-10 wt% based on the oxide of the supported metal and the dry weight of the molecular sieve, wherein the supported metal is one or two selected from lanthanum and cerium; the volume of mesopores in the molecular sieve represents 40-70% by volume of the total pore volume of the molecular sieve by volume, the volume of mesopores and the total pore volume of the molecular sieve are measured by a nitrogen adsorption BET specific surface area method, and the volume of mesopores means the pore volume of the pores having a diameter of more than 2 nm and less than 100 nm. The invention also aims to provide a catalyst containing the molecular sieve of MFI structure rich in mesopores and a process of producing same. The molecular sieve provided by the invention has better ethylene selectivity in the catalytic cracking reaction of petroleum hydrocarbon.