CLAIMS

1. A catalytic cracking catalyst comprising a molecular sieve, and an alumina substrate material having a crystalline phase structure of γ-alumina; wherein in the alumina substrate material, based on the volume of pores with a diameter of 2-100nm, the pore volume of the pores with a diameter of 2-5nm accounts for 0-10%, the pore volume of the pores with a diameter of more than 5nm and not more than 10nm accounts for 10-25%, and the pore volume of the pores with a diameter of more than 10nm and not more than 100nm accounts for 65-90%; and

optionally, the catalyst comprises 25-50 wt% and preferably 25-35 wt% of molecular sieve, 0-50 wt% and preferably 0-30 wt% of clay, 5-35 wt%, e.g., 10-30 wt%, and preferably 15-28 wt% of binder, 2-30 wt% and preferably 5-25 wt% of alumina substrate material; wherein the molecular sieve is one or more selected from the group consisting of Y-type molecular sieve, ZSM-5 molecular sieve and β-molecular sieve.

2. The catalytic cracking catalyst according to claim 1, characterized in that the γ-alumina of the alumina substrate has a crystallinity of 40-60%.

3. The catalytic cracking catalyst according to claim 1, characterized in that the alumina substrate material has a mode pore size in the range of 10-25 nm.

4. The catalytic cracking catalyst according to claim 1, characterized in that the alumina substrate has an Al_2O_3 content of not less than 95 wt%, on a dry basis.

5. The catalytic cracking catalyst according to claim 1 or 2, characterized in that alumina substrate has, on a dry basis, a Fe_2O_3 content of not more than 1.5 wt%, such as not more than 0.5 wt%; a Na_2O content of not more than 1 wt%, such as not more than 0.3 wt%; and a Si_2O content of not more than 1.5 wt%, such as not more than 0.5 wt%.

6. The catalytic cracking catalyst as recited in claim 1 or 2, characterized in that the alumina substrate material has a specific surface

area of 200-300 m^2/g, and a total pore volume of 0.35-0.45 ml/g.

7. The catalytic cracking catalyst according to claim 1 or 2, characterized in that the pores with a diameter of 2-100nm in the alumina substrate material has a pore volume of 0.25 to 0.40ml/g.

8. The catalytic cracking catalyst according to claim 1 or 2, characterized in that the pores having a pore diameter of more than 10nm and not more than 20nm have a pore volume of 0.06 to 0.08 ml/g, the pores having a pore diameter of more than 20nm and not more than 30nm have a pore volume of 0.06 to 0.08 ml/g, the pores having a pore diameter of more than 30nm and not more than 40nm have a pore volume of 0.03 to 0.04 ml/g, and the pores having a pore diameter of more than 40nm and not more than 50nm have a pore volume of 0.03 to 0.04 ml/g.

9. The catalytic cracking catalyst according to claim 1 or 2, characterized in that the alumina substrate material has a B-acid amount of 1-3 $\mu mol.g^{-1}$, such as 1.1-2.5 $\mu mol.g^{-1}$, a L-acid amount of 10-40 $\mu mol.g^{-1}$, such as 13-31 $\mu mol.g^{-1}$, and a molar ratio of B-acid to L-acid of 0.06-0.1.

10. The catalytic cracking catalyst according to claim 1 or 2, characterized in that the alumina substrate has a molar ratio of B-acid/L-acid of 0.065-0.085.

11. The catalytic cracking catalyst according to claim 1 or 2, characterized in that the catalytic cracking catalyst has a weight ratio of the molecular sieve to the alumina material of 1-7:1, on a dry basis; and/or the total content of molecular sieve and said alumina is in the range of from 30 to 55 wt%.

12. The catalytic cracking catalyst according to claim 1 or 2, characterized in that the catalyst has a bimodal pore structure, wherein based on the pores in the range of 0-100nm, the catalyst comprises 30-55%, preferably 40-55%, of pores in the range of 0-3nm; and 30-55%, preferably 40-55%, of pores in the range of 5-100nm.

13. A process for preparing the catalytic cracking catalyst according to any one of claims 1 to 12, comprising: pulping a binder, clay, a molecular

sieve and an alumina substrate material to obtain a catalyst slurry, and spray-drying the catalyst slurry, wherein the alumina substrate material is as defined in any one of claims 1 to 10.

14. The process according to claim 13, wherein the alumina substrate material is prepared by a process comprising:

mixing an aluminum source of Al(OH) structure, an aluminum source of $Al(OH)_3$ structure, a pore-expanding agent and water at a molar ratio of (0.5-2): (0.5-2): (0.5-2): (5-20);

carrying out an aging treatment under water vapor, and optionally drying, to obtain a precursor of the alumina substrate material; wherein the aging treatment is preferably carried out at a temperature of 100-200℃, for preferably 2-5h, and the drying temperature is preferably not more than 200 ℃, such as 100-140 ℃; and

calcinating the precursor of the alumina material, to obtain the alumina material, for which the calcinating is carried out at a temperature of 500-1000℃, for example 500-700℃, for preferably 2-6 hours.

15. The process according to claim 14, characterized in that the aluminum source of Al(OH) structure is one or more selected from the group consisting of pseudoboehmite and boehmite; and the aluminum source of $Al(OH)_3$ structure is one or more selected from the group consisting of gibbsite, bayerite, norite, nordstrandite and amorphous aluminum hydroxide.

16. The process according to claim 14, characterized in that the pore-expanding agent is one or more selected from the group consisting of ammonium bicarbonate, activated carbon, EDTA, n-butylamine, polyacrylamide, n-butanol, and citric acid.

17. The process according to claim 14, characterized in that the molar ratio of the aluminum source of Al(OH) structure, the aluminum source of $Al(OH)_3$ structure, the pore-expanding agent, and water is (0.8-1.2): (0.8-1.2): (0.8-1.2): (8-12).