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 ~~compriss~~ 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 ~~13 or~~ 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 ~~13 or~~ 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 ~~13 or~~ 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).