

CLAIMS

[Claim 1]

A catalyst for fluid catalytic cracking of hydrocarbon oil, comprising a catalyst composition A that comprises FAU type (faujasite type) zeolite and 10 to 30 % by mass of a silica-based binder as a binding agent and a catalyst composition B that comprises FAU type (faujasite type) zeolite and 10 to 30 % by mass of an aluminum-compound binder as a binding agent, mixed therein in any mass proportion in the range of 10:90 to 90:10 ($W_A:W_B$), provided that W_A is the mass of the catalyst composition A and W_B is the mass of the catalyst composition B.

[Claim 2]

The catalyst for fluid catalytic cracking of hydrocarbon oil according to Claim 1, wherein each of the catalyst composition A and the catalyst composition B has a K value as expressed by the following formula (1), which is equal to or higher than 1.

$$K \text{ value} = \text{Conversion rate} / (100 - \text{Conversion rate}) \dots (1)$$

where the conversion rate is expressed by the following formula (2);

$$\text{Conversion rate (\% by mass)} = (a-b)/a \times 100 \dots (2)$$

where the symbol "a" represents the mass of raw material oil, and "b" represents the total mass of light cycle oil and heavy cycle oil.

silica-based binder is one or more of the binding agent(s) selected from the group consisting of a silica sol, a water glass, and an acidic liquid of silicic acid.

[Claim 7]

5 The catalyst for fluid catalytic cracking of hydrocarbon oil according to any of Claims 1 to 6, wherein the aluminum-compound binder is one or more of the binding agent(s) selected from the group consisting of the following compound (a) to (c);

- 10 (a) Basic aluminum chloride,
 (b) Aluminum biphosphate,
 (c) Alumina sol.

[Claim 8]

15 ~~The catalyst for fluid catalytic cracking of hydrocarbon oil according to any of Claims 1 to 7, wherein the zeolite has a crystal structure selected from the group consisting of FAU type (faujasite type), MFI type, CHA type, and MOR type, or a mixture thereof and is contained in the catalyst composition A and the catalyst composition B in the range of~~
 20 ~~15 to 60 % by mass respectively on a catalyst basis.~~

[Claim 9]

25 The catalyst for fluid catalytic cracking of hydrocarbon oil according to Claim 1, wherein the FAU type (faujasite type) zeolite, ~~when it has a crystal structure of the FAU type,~~ is any one of hydrogen Y-

type zeolite (HY), ultrastable Y-type zeolite (USY), rare-earth exchanged Y-type zeolite (REY), and rare-earth exchanged ultrastable Y-type zeolite (REUSY).

[Claim ~~109~~]

5 The catalyst for fluid catalytic cracking of hydrocarbon oil according to any of Claims 1 to ~~98~~, wherein the catalyst composition A and the catalyst composition B further comprise, besides the zeolite and the binding agent, a clay mineral.

[Claim ~~110~~]

10 A method for fluid catalytic cracking of hydrocarbon oil, with use of the above catalyst according to any of Claims 1 to ~~109~~.

[Claim ~~1211~~]

15 The method for fluid catalytic cracking of hydrocarbon oil according to Claim ~~1110~~, wherein the hydrocarbon oil comprises a residual oil.

[Claim ~~1312~~]

20 The method for fluid catalytic cracking of hydrocarbon oil according to Claim ~~1211~~, wherein the hydrocarbon oil comprises vanadium and nickel being equal to or more than 0.5 ppm by mass for each.

[Claim ~~1413~~]

25 The method for fluid catalytic cracking of hydrocarbon oil according to any of Claims ~~11-10~~ to ~~1312~~, wherein the above