Claims

1. A catalyst for producing light olefins from catalytic cracking of hydrocarbon having 4 to 7 carbon atoms, wherein said catalyst comprising zeolite having 8 to 10 silicon atom arranged in ring and hierarchical zeolite comprising 0.1 to 2 nm micropore, 2 to 50 nm mesopore, and more than 50 nm macropore, wherein the mesopore is 40% to 60% of the total pore volume, and said catalyst comprising element having 2^+ to 4^+ oxidation state of 0.1 to 3 % by weight of the catalyst.

2. The catalyst according to claim 1, wherein said zeolite has pore size of 0.35 nm to 0.54 nm.

3. The catalyst according to claim 1, wherein the hierarchical zeolite comprising 0.35 to 0.54 nm micropore and 2 to 10 nm mesopore.

4. The catalyst according to claim 1, wherein said zeolite is ferrierite.

5. The catalyst according to claim 1, wherein said zeolite has mole ratio of silica to alumina from 20 to 60.

6. The catalyst according to claim 1, wherein said element is selected from germanium, zirconium, or boron.

7. The catalyst according to claim 6, wherein said element is germanium.

8. The catalyst according to claim 1, 6, or 7, wherein said element is 0.2 to 1% by weight of the catalyst.

9. A process for producing light olefins, comprising contacting hydrocarbon having 4 to 7 carbon atoms to the catalyst at the temperature of 550 to 650 °C and the pressure of 1 to 3 bars, wherein said catalyst comprising zeolite having 8 to 10 silicon atom arranged in ring and hierarchical zeolite comprising 0.1 to 2 nm micropore, 2 to 50 nm mesopore, and more than 50 nm

macropore, wherein the mesopore is 40 to 60% of the total pore volume, and said catalyst comprising element having 2^+ to 4^+ oxidation state of 0.1 to 3 % by weight of the catalyst.

10. The process according to claim 9, wherein said zeolite has pore size of 0.35 nm to 0.54 nm.

11. The process according to claim 9, wherein the hierarchical zeolite comprising 0.35 to 0.54 nm micropore and 2 to 10 nm mesopore.

12. The process according to claim 9, wherein said zeolite is ferrierite

13. The process according to claim 9, wherein said zeolite has mole ratio of silica to alumina from 20 to 60.

14. The process according to claim 9, wherein said element is selected from germanium, zirconium, or boron.

15. The process according to claim 14, wherein said element is germanium.

16. The process according to claim 9, 14, or 15, wherein said element is 0.2 to 1 % by weight of the catalyst.

17. The process according to claim 9, wherein the hydrocarbon having 4 to 7 carbon atoms can be selected from butane, pentane, hexane and heptane.

18. The process according to claim 9, wherein the light olefin is ethylene, propylene, or mixture thereof.