What is claimed is:

1. A preparation method of a propylene epoxidation catalyst, comprising the following steps:

(1) titanate and ammonium molybdate are dissolved in a low-carbon alcohol, and mixed with a silica gel support to perform a rotary evaporation treatment to remove the low-carbon alcohol to obtain a catalyst precursor;

(2) a calcination treatment is performed on the catalyst precursor obtained in step (1) at elevated temperature to obtain an oxide catalyst, wherein conditions of the calcination treatment are: a calcination atmosphere is ammonia gas, and a two-stage temperature programming is adopted, in which in a first stage, a calcination temperature is 140 ℃ to 160 ℃, a calcination duration is 1 to 3 h, and a space velocity of the ammonia gas is 2 to 5 h^{-1}, and in a second stage, a calcination temperature is 450 ℃ to 600 ℃, a calcination duration is 3 to 5 h, and a space velocity of the ammonia gas is 0.4 to 2 h^{-1}; and

(3) a silylation treatment is performed on the oxide catalyst obtained in step (2) using a silylating reagent to obtain the propylene epoxidation catalyst.

~~2. The preparation method according to claim 1, wherein in step (2), the catalyst precursor is calcined at elevated temperature under an ammonia atmosphere.~~

~~3~~2. The preparation method according to claim 1~~ or 2~~, wherein in step (1), the amount of Ti in the titanate is 2 to 5 wt% of the mass of the silica gel support in step (1), and the concentration of the titanate in the low-carbon alcohol is 1 to 10 wt%; and preferably, the titanate is one or more selected from the group consisiting of tetramethyl titanate, tetraethyl titanate, tetrapropyl titanate, tetraisopropyl titanate, tetrabutyl titanate, and tetraisobutyl titanate.

~~4~~3. The preparation method according to claim ~~3~~2, wherein in step (1), the amount ratio of titanate to ammonium molybdate is such that the molar ratio of Mo to Ti is 0.05:1 to 0.2:1.

~~5~~4. The preparation method according to any one of claims 1 to ~~4~~3, wherein the silica gel support in step (1) has an equivalent spherical diameter of 0.5 to 3 mm and a specific surface area of 800 to 900 m^2/g; and preferably, the silica gel support has an average pore size of 2 to 3 nm.

~~6. The preparation method according to claim 2, wherein in step (2), calcination process conditions are: a calcination atmosphere is ammonia gas, and a two-stage temperature~~

~~programming is adopted, in which in a first stage, a calcination temperature is 140 °C to 160 °C, a calcination duration is 1 to 3 h, and a space velocity of the ammonia gas is 2 to 5 h^{-1}, and in a second stage, a calcination temperature is 450 °C to 600 °C, a calcination duration is 3 to 5 h, and a space velocity of the ammonia gas is 0.4 to 2 h^{-1}.~~

~~7~~5. The preparation method according to claim ~~2 or 6~~1, wherein in step (2), the content of N in the oxide catalyst obtained after the calcination treatment is greater than 0.2 wt%, preferably greater than 0.28 wt%.

~~8~~6. The preparation method according to any one of claims 1 to ~~7~~3, wherein the silylating reagent in step (3) is hexamethyldisilazane, and the temperature of the silylation treatment is 200 °C to 300 °C; and preferably, the amount of the silylating reagent is 5 to 15 wt% of the mass of the silica gel support, and the duration of the silylation treatment is 60 to 180 min.

~~9~~7. The preparation method according to any one of claims 1 to ~~8~~3, wherein during the rotary evaporation treatment in step (1), a rotary evaporation speed is 10 to 100 rpm, a rotary evaporation temperature is 50 °C to 70 °C, and a pressure is 50 to 100 KPa.

~~10~~8. Use of the propylene epoxidation catalyst prepared by the preparation method according to any one of claims 1 to ~~9~~ 7 in catalyzing a propylene epoxidation reaction;

preferably, the propylene epoxidation reaction is a reaction in which propylene is reacted with cumene hydroperoxide as an oxidizing agent to prepare propylene oxide; further preferably, in the reaction, the molar ratio of the propylene to the cumene hydroperoxide is 5:1 to 7:1, and a weight hourly space velocity is 2 to 3.5 h^{-1}.