DESCRIPTION

# ADSORBENT AND MANUFACTURING METHOD OF THE SAME

## TECHNICAL FIELD

[0001]

The present invention relates to an adsorbent for removing carbonyl sulfide.

## BACKGROUND ART

[0002]

Carbonyl sulfide (chemical formula: COS), which is a kind of sulfur compound, is a poisonous compound to various catalysts. For instance, it is known that propylene, whose demand has been recently growing, contains minute amounts of impurities including carbonyl sulfide. When the propylene is subjected to a polymerization process without being purified, the carbonyl sulfide poisons a propylene polymerization catalyst (Patent Literature 1).

[0003]

In order to remove the impurities, for instance, a distillation method for separating a target compound and impurities using a difference in boiling points has been industrially used. However, it is also known that, due to the proximity of the boiling points of propylene and carbonyl sulfide, the carbonyl sulfide contained in propylene is difficult to be completely removed by the distillation method. It is also known that, in the same manner as propylene, the carbonyl sulfide, which is contained in hydrocarbons having 2 to 6 carbon atoms with boiling points proximate to carbonyl sulfide, is difficult to be completely separated by the distillation method (Patent Literature 2).

[0004]

Examples of known methods for removing carbonyl sulfide, which is difficult to be separated by the distillation method, include a method for removing carbonyl sulfide by bringing carbonyl sulfide into contact with an adsorbent, a method for removing carbonyl sulfide by bringing carbonyl sulfide into contact with an absorbing liquid, and a method for removing carbonyl sulfide through hydrolysis.

[0005]

For instance, Patent Literature 3 discloses a method for bringing a stream

CLAIM(S)

1. An adsorbent for removing carbonyl sulfide contained in a stream containing an olefin, the adsorbent comprising:

copper oxide; and

an aluminum compound, wherein

a content of the aluminum compound is in a range from 10 mass% to 50 mass% in terms of Al, and

the adsorbent exhibits an $NH_3$ desorption in a range of more than 0.001 mmol/g and 0.05 mmol/g or less as calculated based on a temperature-programmed desorption of ammonia in a temperature region ranging from 100 degrees C to 200 degrees C ~~is in a range of more than 0.001 mmol/g and 1 mmol/g or less~~.

2. The adsorbent according to claim 1, wherein the aluminum compound exhibits the $NH_3$ desorption in a range from 0.01 mmol/g to ~~10~~ 0.05 mmol/g as calculated based on a temperature-programmed desorption of ammonia in the temperature region ranging from 100 degrees C to 200 degrees C.

3. The adsorbent according to claim 2, wherein the aluminum compound is at least one selected from the group consisting of aluminum hydroxide and aluminum oxide.

4. The adsorbent according to claim 3, wherein a crystal structure of the aluminum hydroxide is pseudo-boehmite.

5. The adsorbent according to claim 3, wherein a crystal structure of the aluminum oxide is at least one crystal structure selected from the group consisting of χ, ρ, and θ.

6. The adsorbent according to any one of claims 1 to 5, wherein a specific surface area of the adsorbent is less than 200 $m^2/g$.

7. The adsorbent according to any one of claims 1 to 6, wherein a content of the copper oxide is in a range from 5 mass% to 50 mass% in terms of Cu.

8. The adsorbent according to claim 7, wherein a Cu/Al molar ratio is in a range from 0.1 to 2.

9. The adsorbent according to any one of claims 1 to 8, wherein a content of alkali is less than 0.5 mass%.

10. A method of manufacturing an adsorbent for removing carbonyl sulfide

contained in a stream containing an olefin, the method comprising:

mixing an aluminum compound and copper oxide so that a content of the aluminum compound is in a range from 10 mass% to 50 mass% in terms of Al, the aluminum compound exhibiting an $NH_3$ desorption in a temperature region ranging from 100 degrees C to 200 degrees C as calculated based on temperature-programmed desorption of ammonia being in a range from 0.01 mmol/g to ~~10~~ 0.05 mmol/g.