PATENT DOCUMENT

[0004]

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SUMMARY OF THE INVENTION

TECHNICAL PROBLEM

[0005]

In the adsorption heat exchanger, adsorption performance may deteriorate, especially when the adsorption layer deteriorates in a short period of time.

[0006]

Embodiments of the present disclosure substantially prevent deterioration of the adsorption layer in the adsorption heat exchanger.

SOLUTION TO THE PROBLEM

[0007]

An aspect of the present disclosure is directed to an adsorption heat exchanger including a base sheet and an adsorbent supported on the base sheet. The adsorbent is supported by using a binder and a crosslinking agent, the base sheet is made of aluminum or aluminum with a resin coating layer on its surface, the adsorbent includes at least one of sodium polyacrylate, silica, or a metal organic framework, the binder includes at least one of a fluorine resin, an acrylic resin, or an epoxy resin, and the crosslinking agent is a hydrocarbon having a carbodiimide group.

[0008]

In the above aspect, the adsorbent is supported by using the crosslinking agent in addition to the binder. Thus, the adsorbent detached when the adsorption heat exchanger is practically used can be reduced.

[0009]

In an embodiment of the above aspect, the base sheet is made of aluminum or aluminum with a resin coating layer on its surface, the adsorbent includes at least one of sodium polyacrylate, silica, or a metal organic framework, the binder includes at least one of a fluorine resin, an acrylic resin, an epoxy resin, or an urethane resin, and the crosslinking agent is a hydrocarbon having at least one of a carbodiimide group, an isocyanate group, or an ester group.

[0010]

In the above embodiment, the above-described materials are used as the components. Thus, the adsorbent detached can be reduced more reliably.

[0011]

In an embodiment of the above aspect, the binder is used in an amount of 16 parts by mass or more to 70 parts by mass or less with respect to 100 parts by mass of the adsorbent , and the crosslinking agent is used in an amount in which an acid value or hydroxyl value of the crosslinking agent is 20% or more to 50% or less of an acid value or a hydroxyl value of the binder.

[0012]

In the above embodiment, the adsorbent, the binder, and the crosslinking agent are used in amounts described above. Thus, the adsorbent detached can be reduced more reliably.

[0013]

In an embodiment of the above aspect, the adsorbent is supported by using an additive in addition to the binder and the crosslinking agent.

[0014]

In the above embodiment, the additive is further used. Thus, the adsorbent detached

CLAIMS

1. An adsorption heat exchanger comprising:

a base sheet; and

an adsorbent supported on the base sheet, wherein

the adsorbent is supported by using a binder and a crosslinking agent,

the base sheet is made of aluminum or aluminum with a resin coating layer on its surface,

the adsorbent includes at least one of sodium polyacrylate, silica, or a metal organic framework,

the binder includes at least one of a fluorine resin, an acrylic resin, or an epoxy resin, and

the crosslinking agent is a hydrocarbon having a carbodiimide group.

2. The adsorption heat exchanger of claim 1, wherein

the binder is used in an amount of 16 parts by mass or more to 70 parts by mass or less with respect to 100 parts by mass of the adsorbent, and

the crosslinking agent is used in an amount in which an acid value or hydroxyl value of the crosslinking agent is 20% or more to 50% or less of an acid value or a hydroxyl value of the binder.

3. The adsorption heat exchanger of claim 1 or 2, wherein

the adsorbent is supported by using an additive in addition to the binder and the crosslinking agent, the additive being at least one of a hydrocarbon having a carboxyl group or a hydrocarbon having a hydroxyl group.