PATENT DOCUMENT

[0004]

Patent Document 1: Japanese Unexamined Patent Publication No. 2009-019863

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]

~~It is an object~~Embodiments of the present disclosure ~~to~~ substantially prevent deterioration of the adsorption layer in the adsorption heat exchanger.

SOLUTION TO THE PROBLEM

[0007]

~~A first~~An aspect of the present disclosure is directed to an adsorption heat exchanger ~~(20)~~ including a base sheet ~~(26)~~ and an adsorbent ~~(41)~~ supported on the base sheet ~~(26)~~. The adsorbent ~~(41)~~ is supported by using a binder ~~(42)~~ and a crosslinking agent.

[0008]

In the first aspect, the adsorbent ~~(41)~~ is supported by using the crosslinking agent in addition to the binder ~~(42)~~. Thus, the adsorbent ~~(42)~~ detached when the adsorption heat exchanger ~~(20)~~ is practically used can be reduced.

[0009]

~~A second aspect of the present disclosure is~~In an embodiment of the first aspect~~. In the second aspect~~, the base sheet ~~(26)~~ is made of aluminum or aluminum with a resin coating layer ~~(43)~~ on its surface, the adsorbent ~~(41)~~ includes at least one of sodium polyacrylate,

silica, or a metal organic framework, the binder ~~(42)~~ 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 ~~second aspect~~above embodiment, the above-described materials are used as the components. Thus, the adsorbent ~~(42)~~ detached can be reduced more reliably.

[0011]

~~A third aspect of the present disclosure is~~In an embodiment of the ~~first or second aspect. In the third~~ 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 ~~(41)~~, 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 ~~adsorbent (41)~~binder.

[0012]

In the ~~third aspect~~above embodiment, the adsorbent ~~(41)~~, the binder ~~(42)~~, and the crosslinking agent are used in amounts described above. Thus, the adsorbent ~~(42)~~ detached can be reduced more reliably.

[0013]

~~A fourth aspect of the present disclosure is~~In an embodiment of ~~any one of the first to third aspects. In the fourth~~the above aspect, the adsorbent ~~(41)~~ is supported by using an additive in addition to the binder ~~(42)~~ and the crosslinking agent.

[0014]

In the ~~fourth aspect~~above embodiment, the additive is further used. Thus, the adsorbent ~~(42)~~ detached