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DESCRIPTION CN213853119U

An evaporation apparatus for the extraction of 3,3-diindolemethane

一种3,3-二吲哚甲烷提取用蒸发装置

[0001]

Technical Field

技术领域

[n0001]

This utility model relates to the field of evaporation equipment technology, specifically to an evaporation device for the extraction of 3,3-diindolemethane.

本实用新型涉及蒸发设备技术领域，具体地说就是一种3,3-二吲哚甲烷提取用蒸发装置。

[0003]

Background Technology

背景技术

[n0002]

Currently in the chemical industry, in order to concentrate a liquid with a lower concentration into a liquid with a higher concentration, the evaporation process generally adopts the method of heating the medium to be evaporated, i.e., the liquid to be concentrated, using a steam jacket for evaporation.

目前在化工行业中，为了使浓度较低的液体浓缩为浓度较高的液体，其蒸发工艺普遍采用蒸汽夹套对被蒸发介质即需要浓缩的液体加热进行蒸发的方式。

The material is heated by a jacket, which evaporates the moisture in the material and concentrates it. However, in the existing evaporation device, the contact area between the material and the heating device is small, the heating effect is poor, the concentration time is long, and the production efficiency is low.

通过夹套对物料进行加热，进而对使物料中的水分蒸发出去，使物料达到浓缩效果，现有技术中的蒸发装置内部的物料与加热装置接触面积小，加热效果差，浓缩时间较长，生产效率低。

For example, the extraction of 3,3-diindolemethane requires concentration of the 3,3-diindolemethane solution, followed by evaporation and crystallization. Existing concentration equipment has low concentration efficiency, which affects production efficiency.

如3,3-二吲哚甲烷提取使需要对3,3-二吲哚甲烷的溶液进行浓缩，浓缩后再进行蒸发结晶，现有技术中的浓缩设备浓缩效率低，影响生产效率。

[0005]

Utility Model Content

实用新型内容

[n0003]

To address the problem of poor evaporation efficiency in the aforementioned evaporation devices, this invention provides an evaporation device for the extraction of 3,3-diindolemethane.

为解决上述蒸发装置蒸发效果差的问题，本实用新型提供了一种3,3-二吲哚甲烷提取用蒸发装置。

[n0004]

The technical solution adopted by this utility model to solve its technical problem is: an evaporation device for extracting 3,3-diindolemethane, comprising an evaporation device body, an evaporation plate disposed inside the evaporation device body, a stirring device disposed at the bottom of the evaporation device body, and a heating device disposed on the evaporation plate. The evaporation plate includes several right-side evaporation plates and several left-side evaporation plates, which are arranged alternately. The stirring device includes a stirring shaft disposed at the bottom of the evaporation device body, a stirring paddle disposed on the stirring shaft, and a drive motor disposed at the bottom of the stirring shaft. The stirring paddle is disposed above the bottom surface of the evaporation device body. The heating device includes a heating tube, one end of which is disposed inside the evaporation plate, and the other end of which is disposed outside the evaporation device body.

本实用新型解决其技术问题所采取的技术方案是：一种3,3-二吲哚甲烷提取用蒸发装置，包括蒸发装置主体、设置于蒸发装置主体内部的蒸发板、设置于蒸发装置主体底部的搅拌装置和设置于蒸发板上的加热装置，所述的蒸发板包括若干个右侧蒸发板和若干个左侧蒸发板，所述的左侧蒸发板和右侧蒸

发板交错设置，所述的搅拌装置包括设置于蒸发装置主体底部的搅拌轴、设置于搅拌轴上的搅拌桨和设置于搅拌轴底部的驱动电机，所述的搅拌桨设置于蒸发装置主体的底面上方，所述的加热装置包括加热管，所述加热管一端设置于蒸发板内部，所述的加热管另一端设置于蒸发装置主体外部。

[n0005]

As an optimization, the evaporator body has a feed inlet at the top, a discharge outlet at the bottom, and an exhaust pipe at the upper side of the evaporator body.

作为优化，所述的蒸发装置主体顶部设有进料口，所述的蒸发装置主体下部设有出料口，所述的蒸发装置主体侧面上部设有排气管。

[n0006]

As an optimization, the evaporation plate is positioned directly below the feed inlet, the left end of the right evaporation plate is inclined downwards, and the right end of the left evaporation plate is inclined downwards.

作为优化，所述的蒸发板设置于进料口的正下方，所述的右侧蒸发板的左端向下倾斜，所述的左侧蒸发板的右端向下倾斜。

[n0007]

As an optimization, the bottom of the evaporation plate is provided with two mounting slots, and the side wall of the main body of the evaporation device is provided with a mounting bracket, which is set in the mounting slot.

作为优化，所述的蒸发板底部设有两个安装槽，所述的蒸发装置主体的侧壁上设有安装架，所述的安装架设置于安装槽内。

[n0008]

As an optimization, the bottom surface of the stirring paddle is positioned close to the inner bottom surface of the evaporator body, and the end of the stirring paddle is positioned close to the interior of the evaporator body.

作为优化，所述的搅拌桨底面接近蒸发装置主体的内部底面设置，所述的搅拌桨末端接近蒸发装置主体内部。

[n0009]

As an optimization, the exhaust pipe is equipped with an induced draft fan, and a filter screen is provided at the connection between the exhaust pipe and the main body of the evaporator.

作为优化，所述的排气管上设有引风机，所述的排气管与蒸发装置主体连接处设有过滤网。

[n0010]

As an optimization, a heating jacket is provided on the outside of the main body of the evaporation device.

作为优化，所述的蒸发装置主体外部设有加热套。

[n0011]

The overall beneficial effects of this solution are as follows: An evaporation device for the extraction of 3,3-diindolemethane, by setting evaporation plates inside the evaporation

device, allows the material to pass sequentially through the staggered left and right evaporation plates when entering the main body of the evaporation device. Heating tubes are installed inside the evaporation plates to heat the material flowing through them. Furthermore, the device is equipped with a stirring device at the bottom and an exhaust pipe at the top, which can effectively improve the heat exchange efficiency inside the main body of the evaporation device. This device can effectively increase the contact area and contact time between the material and the evaporation plates, effectively increase the heating and evaporation efficiency of the material, and improve the production efficiency of the equipment.

本方案的整体有益效果是：一种3,3-二吡啶甲烷提取用蒸发装置，通过在蒸发装置内部设置蒸发板，使物料进入蒸发装置主体内部时能够依次经过交错设置的左侧蒸发板和右侧蒸发板，蒸发板内部设有加热管，能够对流经蒸发板的物料进行加热，并且本装置底部设有搅拌装置，上部设有排气管道，能够有效提高蒸发装置主体内部的热交换效率，该装置能够有效增加物料于蒸发板的接触面积与接触时间，能够有效增加物料的加热蒸发效率，提高设备的生产效率。

[0015]

Attached Figure Description

附图说明

[n0012]

Figure 1 is an axonometric view of the present invention.

附图1为本实用新型的轴侧示意图。

[n0013]

Figure 2 is a top view of the present invention.

附图2为本实用新型俯视示意图。

[n0014]

Figure 3 is a schematic diagram of the cross-sectional structure along line A-A in Figure 2.

附图3为附图2的A-A剖切结构示意图。

[n0015]

Figure 4 is a front view schematic diagram of this utility model.

附图4为本实用新型主视示意图。

[n0016]

Figure 5 is a schematic diagram of the front view sectional structure of this utility model.

附图5为本实用新型主视剖切结构示意图。

[n0017]

Figure 6 is a rear view schematic diagram of this utility model.

附图6为本实用新型后视示意图。

[n0018]

Figure 7 is a schematic diagram of the B-B cross-section structure of Figure 6.

附图7为附图6的B-B剖切结构示意图。

[n0019]

The components include: 1. Evaporation device body; 2. Stirring device; 3. Heating device; 4. Right side evaporation plate; 5. Left side evaporation plate; 6. Stirring shaft; 7. Stirring paddle; 8. Drive motor; 9. Heating tube; 10. Feed inlet; 11. Discharge outlet; 12. Exhaust pipe; 13. Mounting frame; and 14. Exhaust fan.

其中，1、蒸发装置主体，2、搅拌装置，3、加热装置，4、右侧蒸发板，5、左侧蒸发板，6、搅拌轴，7、搅拌桨，8、驱动电机，9、加热管，10、进料口，11、出料口，12、排气管，13、安装架，14、引风机。

[0024]

Detailed Implementation

具体实施方式

[n0020]

To make the objectives, technical solutions, and advantages of the embodiments of this utility model clearer, the technical solutions of the embodiments of this utility model will be

clearly and completely described below with reference to the accompanying drawings.

Obviously, the described embodiments are some embodiments of this utility model, but not all embodiments.

为使本实用新型实施例的目的、技术方案和优点更加清楚，下面将结合本实用新型实施例中的附图，对本实用新型实施例中的技术方案进行清楚、完整地描述，显然，所描述的实施例是本实用新型一部分实施例，而不是全部的实施例。

The components of the present invention embodiments typically described and illustrated in the accompanying drawings can be arranged and designed in a variety of different configurations.

通常在此处附图中描述和示出的本实用新型实施例的组件可以以各种不同的配置来布置和设计。

Therefore, the following detailed description of embodiments of the present invention provided in the accompanying drawings is not intended to limit the scope of the claimed invention, but merely to illustrate selected embodiments of the invention.

因此，以下对在附图中提供的本实用新型的实施例的详细描述并非旨在限制要求保护的本实用新型的范围，而是仅仅表示本实用新型的选定实施例。

Based on the embodiments of this utility model, all other embodiments obtained by those skilled in the art without creative effort are within the scope of protection of this utility model.

基于本实用新型中的实施例，本领域普通技术人员在没有做出创造性劳动前提下所获得的所有其他实施例，都属于本实用新型保护的范围。

[n0021]

It should be noted that similar labels and letters in the following figures indicate similar items. Therefore, once an item is defined in one figure, it does not need to be further defined and explained in subsequent figures.

应注意到：相似的标号和字母在下面的附图中表示类似项，因此，一旦某一项在一个附图中被定义，则在随后的附图中不需要对其进行进一步定义和解释。

[n0022]

In the description of this utility model, it should be noted that the terms "center", "upper", "lower", "left", "right", "vertical", "horizontal", "inner", "outer", etc., indicate the orientation or positional relationship based on the orientation or positional relationship shown in the accompanying drawings, or the orientation or positional relationship commonly used when the utility model product is in use. They are only for the convenience of describing this utility model and simplifying the description, and do not indicate or imply that the device or element referred to must have a specific orientation, or be constructed and operated in a specific orientation. Therefore, they should not be construed as limitations on this utility model.

在本实用新型的描述中，需要说明的是，术语“中心”、“上”、“下”、“左”、“右”、“竖直”、“水平”、“内”、“外”等指示的方位或位置关系为基于附图所示的方位或位置关系，或者

是该实用新型产品使用时惯常摆放的方位或位置关系，仅是为了便于描述本实用新型和简化描述，而不是指示或暗示所指的装置或元件必须具有特定的方位、以特定的方位构造和操作，因此不能理解为对本实用新型的限制。

Furthermore, the terms "first," "second," and "third" are used only to distinguish descriptions and should not be interpreted as indicating or implying relative importance.

此外，术语“第一”、“第二”、“第三”等仅用于区分描述，而不能理解为指示或暗示相对重要性。

[n0023]

As shown in Figures 1-5, an evaporation apparatus for extracting 3,3-diindolemethane includes an evaporation apparatus body 1, an evaporation plate disposed inside the evaporation apparatus body 1, a stirring device 2 disposed at the bottom of the evaporation apparatus body 1, and a heating device 3 disposed on the evaporation plate. The evaporation plate includes several right-side evaporation plates 4 and several left-side evaporation plates

5, which are arranged alternately. The stirring device 2 includes a stirring shaft 6 disposed at the bottom of the evaporation apparatus body 1, a stirring paddle 7 disposed on the stirring shaft 6, and a drive motor 8 disposed at the bottom of the stirring shaft 6. The stirring paddle 7 is disposed above the bottom surface of the evaporation apparatus body 1. The heating device 3 includes a heating tube 9, one end of which is disposed inside the evaporation plate, and the other end of which is disposed outside the evaporation apparatus body 1.

如图1~5所示，一种3,3-二吡啶甲烷提取用蒸发装置，包括蒸发装置主体1、设置于蒸发装置主体1内部的蒸发板、设置于蒸发装置主体1底部的搅拌装置2和设置于蒸发板上的加热装置3，所述的蒸发板包括若干个右侧蒸发板4和若干个左侧蒸发板5，所述的左侧蒸发板5和右侧蒸发板4交错设置，所述的搅拌装置2包括设置于蒸发装置主体1底部的搅拌轴6、设置于搅拌轴6上的搅拌桨7和设置于搅拌轴6底部的驱动电机8，所述的搅拌桨7设置于蒸发装置主体1的底面上方，所述的加热装置3包括加热管9，所述加热管9一端设置于蒸发板内部，所述的加热管9另一端设置于蒸发装置主体1外部。

[n0024]

The evaporator body 1 has a feed inlet 10 at the top, a discharge outlet 11 at the bottom, and an exhaust pipe 12 on the upper side of the evaporator body 1.

所述的蒸发装置主体1顶部设有进料口10，所述的蒸发装置主体1下部设有出料口11，所述的蒸发装置主体1侧面上部设有排气管12。

[n0025]

The evaporation plate is located directly below the feed inlet 10, with the left end of the right evaporation plate 4 tilted downwards and the right end of the left evaporation plate 5 tilted downwards.

所述的蒸发板设置于进料口10的正下方，所述的右侧蒸发板4的左端向下倾斜，所述的左侧蒸发板5的右端向下倾斜。

[n0026]

The evaporation plate has two mounting slots at its bottom, and the evaporation device body 1 has a mounting bracket 13 on its side wall, which is located in the mounting slot.

所述的蒸发板底部设有两个安装槽，所述的蒸发装置主体1的侧壁上设有安装架13，所述的安装架13设置于安装槽内。

[n0027]

The bottom surface of the stirring paddle 7 is close to the inner bottom surface of the evaporator body 1, and the end of the stirring paddle 7 is close to the interior of the evaporator body 1.

所述的搅拌桨7底面接近蒸发装置主体1的内部底面设置，所述的搅拌桨7末端接近蒸发装置主体1内部。

[n0028]

The exhaust pipe 12 is equipped with an induced draft fan 14, and a filter screen is provided at the connection between the exhaust pipe 12 and the main body 1 of the evaporator.

所述的排气管12上设有引风机14，所述的排气管12与蒸发装置主体1连接处设有过滤网。

[n0029]

The main body 1 of the evaporation device is provided with a heating jacket.

所述的蒸发装置主体1外部设有加热套。

[n0030]

In practical use, the material to be concentrated is injected into the evaporator body 1 through the feed inlet 10 located at the top. The material passes through the downward-sloping left evaporator plate 5 and right evaporator plate 4, and finally flows into the bottom of the evaporator body 1. After being stirred by the stirring device 2, the evaporation of the material is accelerated. Then the concentrated material is discharged from the evaporator body 1 through the discharge outlet 11 at the bottom.

该装置在具体使用时，通过设置于顶部的进料口10将需要浓缩的物料注入到蒸发装置主体1内部，物料经过向下倾斜的左侧蒸发板5和右侧蒸发板4，最后流入蒸发装置主体1底部，经搅拌装置2搅拌，加速物料的蒸发，随后浓缩的物料从底部的出料口11排出蒸发装置主体1。

The evaporation plate is equipped with a heating tube 9 inside, so that the material can make

full contact with the evaporation plate when it passes through the heated evaporation plate, thereby improving the evaporation efficiency.

蒸发板内部设有加热管9，物料经过加热的蒸发板时能够与蒸发板进行充分接触，提高蒸发效率。

[n0031]

The above-described specific embodiments are merely specific examples of this utility model. The patent protection scope of this utility model includes, but is not limited to, the product form and style of the above-described specific embodiments. Any evaporation device for extracting 3,3-diindolemethane that conforms to the claims of this utility model and any appropriate changes or modifications made thereto by a person skilled in the art should fall within the patent protection scope of this utility model.

上述具体实施方式仅是本实用新型的具体个案，本实用新型的专利保护范围包括但不限于上述具体实施方式的产品形态和式样，任何符合本实用新型权利要求书的一种3,3-二吡啶甲烷提取用蒸发装置且任何所属技术领域的普通技术人员对其所做的适当变化或修饰，皆应落入本实用新型的专利保护范围。