

DESCRIPTION

ADSORPTION CARRIER-PACKED COLUMN

TECHNICAL FIELD

5 [0001]

The present invention relates to an adsorption carrier-packed column which reduces bypassing.

BACKGROUND ART

[0002]

10 A variety of columns packed with adsorption carriers have been devised for removal/recovery of unnecessary components from liquids and gases. The structures of the columns can be divided, based on the flow of the medium, into two large groups: the axial flow and the radial flow. The axial flow is used mainly for analysis and fractionation by GC, HPLC, GPC, or the like, and the radial flow is used
15 for body fluid processing columns and the like (Patent Document 1). The radial flow is thought to be especially efficient from the viewpoint of contacting with the carrier, and products in which an adsorption carrier is wound around a central pipe are widely used in the field of extracorporeal circulation (Patent Document 2).

PRIOR ART DOCUMENTS

20 [Patent Documents]

[0003]

[Patent Document 1] JP 2004-41527 A

[Patent Document 2] WO 2000/38763

SUMMARY

25 PROBLEMS TO BE SOLVED

[0004]

However, in the conventional radial flow columns described in Patent

Documents 1 and 2, gaps are generated at the inlet and outlet plates arranged above and below the adsorption carrier, and the medium preferentially flows through the gaps, which show no resistance. This causes bypassing, resulting in insufficient exertion of the capacity of the adsorption carrier in some cases. In order to avoid the bypassing, there are limitations, for example, that each pore on the central pipe cannot be provided in the vicinities of the plates. A countermeasure for the gaps is filling of the gaps with a resin, and urethane resins and epoxy resins are mainly used therefor (CELLSORBA (registered trademark), manufactured by Asahi Kasei Medical Co., Ltd.). Uniform application of urethane resins and epoxy resins requires a technique. Moreover, since they are in the forms of pastes, their operability under clean circumstances is poor, and, in cases where the adsorption carrier is wet, use of such resins is restricted, so that the resins lack versatility.

Furthermore, since a reactive base resin and a curing agent need to be mixed together for producing a resin immediately before the application, there is a possibility that the base resin or the curing agent reacts with the adsorption carrier to cause deterioration of the adsorption carrier, and there are also safety problems such as the irritant nature and harmfulness to operators, so that a simpler method has been demanded.

[0005]

The present disclosure aims to prepare a radial flow column in which an adsorption carrier is packed, wherein the adsorption carrier-packed radial flow column enables maximal exertion of the performance of the adsorption carrier contained therein by reducing bypassing and allowing uniform flow of the flowing liquid.

MEANS FOR SOLVING THE PROBLEMS

[0006]

As a result of intensive study to solve the problems described above, the

present inventors discovered that, in cases where insertion materials having deformation rates of not less than the deformation rate of the adsorption carrier and having thicknesses suitable for the gaps between the absorption carrier and the plates are inserted in the gaps, the gaps between the absorption carrier and the plates can be eliminated, so that bypassing can be avoided and the adsorption carrier can be uniformly used. This eliminates the limitation of the position(s) of the pore(s) on the central pipe, thereby completing the present disclosure.

[0007]

That is, the present disclosure provides the adsorption carrier-packed columns described in (1) to (5) below.

(1) In an aspect, there is provided an adsorption carrier-packed column which is a radial flow type adsorption carrier-packed column, comprising:

a central pipe in which a pore(s) provided for allowing outflow of a supplied liquid is/are formed on a longitudinal side surface(s);

an adsorption carrier packed in the circumference of the central pipe, for allowing adsorption of a target molecule(s) or a target cell(s) contained in the liquid;

a plate A communicating with the upstream end of the central pipe such that the inflowing liquid passes through the central pipe, the plate A being arranged such that contacting of the liquid with the adsorption carrier without passing through the central pipe is prevented; and

a plate B arranged such that the downstream end of the central pipe is sealed and the adsorption carrier is immobilized in the space in the circumference of the central pipe;

wherein

an insertion material C is inserted between the adsorption carrier and the plate A;

an insertion material D is inserted between the adsorption carrier and the plate