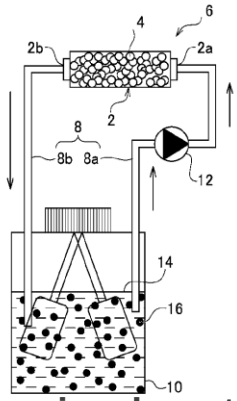
Tohoku Univ. Technology

Ammonia Adsorbent and removal method

Reductions in glucose levels are suppressed, and cultivate cells more efficiently



2. Container
4. Ammonia absorbent
6. Adsorption Module
8. Circulation path
10. Culture vessel
12. Pump
14. Culture fluid
16. Cell
18. Diaphragm

Overview

In recent years, there has been a demand for mass culture of cells in fields such as pharmaceutical manufacturing. Ammonia accumulating in the culture medium must be removed in order for cells to grow stably during culture. Ammonia is known as a typical waste product that adversely affects cells. Until now, waste products were removed from the culture using the principle of dialysis. However, in order to remove waste products sufficiently, the volume of the component preparation liquid tank was set to be more than 10 times the volume of the cell culture tank, so there was a problem that the required volume of liquid was enormous and costly.

The present invention made it possible to provide a new ammonia removal technology. Embodiments of the present invention are an ammonia adsorbent and an ammonia removal method. The ammonia adsorbent of the present invention comprises at least one substance among L-type zeolite, ferrierite, ZSM-5 type zeolite, a strong acid cation exchange resin and a Prussian blue type complex. Thus, cells can be cultured more efficiently.

High ammonia adsorption rate and low glucose adsorption rate were compatible

	L-type zeolite	Ferrierite	ZSM-5 type zeolite	Strong acid cation exchange resin			Prussian blue type complex
ADSORBENT	500KOA	720KOA	822HOA	PK216LH	PK216	SK112L	PRUSSIAN BLUE
RATE OF AMMONIA ADSORPTION (%)	82.9	36.1	77	93.5	27	31	53.9

ADSORBENT	500KOA	720KOA	822HOA	PK216LH	PK216	SK112L	PRUSSIAN BLUE
RATE OF GLUCOSE ADSORPTION (%)	10.9	9.3	2.6	1.3	0	2.2	12

Product Application

- Application to culture medium regeneration technology in mass culture of cells, etc.

Related Works

[1] Kameda T, et al. Colloids and Surfaces A: Physicochemical and Engineering Aspects 622 (2021) 126595.

IP Data

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