

Lactic acid Adsorbent and method for removing Lactic acid

Reduces adverse effects on cell and microbial growth while increasing the efficiency of lactic acid removal

Overview

In recent years, there has been a demand for mass culture of cells in fields such as pharmaceutical manufacturing. In order to grow cells stably in culture, lactic acid (a cellular waste product that adversely affects cells) that accumulates in the culture medium must be removed. Until now, lactic acid was removed from the culture medium using the principle of dialysis. However, in order to remove lactic acid 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.

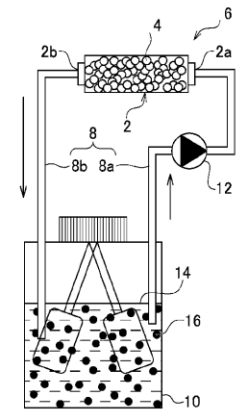
The present invention has made it possible to provide a new lactic acid removal technology that reduces the negative effects of lactic acid and lactic acid removal treatment on the growth of cells and microorganisms while increasing the lactic acid removal efficiency. An embodiment of the present invention is a lactic acid adsorbent, characterized in that it comprises a layered double hydroxide having anions and water molecules retained between layers of a plurality of metal hydroxide layers. When the present invention comes into contact with a solution containing lactic acid, lactic acid in the solution is adsorbed. Thus, the removal efficiency of lactic acid can be enhanced.

Product Application

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

IP Data

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- 2. Container
- 4. Lactic acid adsorbent
- 6. Adsorption Module
- 8. Circulation path
- 10. Culture vessel
- 12. Pump
- 14. Culture fluid
- 16. Cell
- 18. Diaphragm

It was confirmed that the adsorption rate of lactic acid was high, but the adsorption rate of glucose was low, and that the adsorption rate of lactic acid was very low

	CO ₃ -TYPE Mg-Al LDH	Cl- TYPE Mg-Al LDH	NO ₃ -TYPE Mg-Al LDH	HEPES- TYPE Mg-Al LDH
ADSORBENT CONCENTRATION (g/mL)	0.025			
LACTIC ACID ADSORPTION RATE (%)	0	45	68	73
GLUCOSE ADSORPTION RATE (%)	5	2	8	17

	Control	HEPES- TYPE Mg-Al LDH	PYRUVIC ACID-TYPE Mg-Al LDH	CITRIC ACID-TYPE Mg-Al LDH	L-ALANYL- L-GLUTAMINE-TYPE Mg-Al LDH
CELL PROLIFERATION RATE	1	1.25	1.05	0.92	1.15

Related Works

- [1] Kameda T, et al. Colloids and Surfaces A: Physicochemical and Engineering Aspects 612 (2021) 125975.

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