

Upgrade kit for bioreactors (bio-electrosynthesis)

Upgrade kit to enhance conventional bioreactors/fermentors with laboratory reactor systems for conducting comparable and scalable experiments on microbial electrosynthesis for different bioreactor platforms



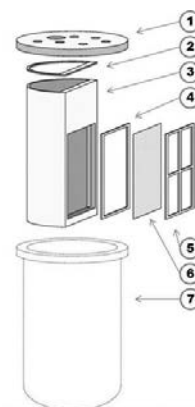
Upgrade kit for bioreactors / Photo: A. Künzelmann, UFZ

Technology

The kit is used to upgrade conventional bioreactors, thereby allowing for applications in the field of microbial bioelectrosynthesis. This upgrade kit is compatible with bioreactors of several different makes, reactor volumes and geometries.

The upgrade kit (design example) for standard bioreactors for bioelectrosynthesis consists of:

- 1 – reactor cover with individual installation options, e.g. for electrodes and stirrers
- 2 – seal to connect the cover and the inner reaction chamber
- 3 – inner reaction chamber, preferably made of electrochemically inert material with an opening to attach the membrane
- 4 – seal
- 5 – cover for fixing the membrane
- 6 – ion-selective membrane
- 7 – conventional bioreactor



Biotechnology

Offer no: TOEN-15/11/3

Expertise

- Bio-electrosynthesis
- Electrochemical fermentation control
- Bioreactors
- Microbial electrosynthesis
- Geobiotechnology
- Bio-corrosion research

Reference

GIMKIEWICZ, C., HUNGER, S., STANG, C., ROSA, L.F.M., ZEHNSDORF, A., HARNISCH, F. (2015):

Bioreactors go electro – Bioreaktoren für Bioelektro-technologie aufrüsten. *Biospektrum* 21, 453 - 454

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Innovation

Compared to traditional (electrochemical) synthesis, microbial bioelectrosynthesis has a number of advantages such as potentially higher selectivity, higher yields etc. However, only very few successful syntheses have been published till date. All research with respect to the technology used so far is in the initial stage. With this upgrade kit it is possible to convert standard bioreactors to bioreactors for bioelectrosynthesis using their conventional associated control technology and peripheral equipment. This upgrade is reversible, eliminating the need for expensive duplicate purchases. Furthermore, unlike other approaches, this system allows the processes to be scaled systematically.

Current developments

Demonstration possible – tested under real conditions on 1l and 2l scale.

Property rights status

Published patents: DE102013224673A1, WO2015082490 A1

Offer

We are looking for an industry partner (preferably a manufacturer of bioreactors or electrochemical reaction technology) to develop the existing prototypes for production and sale of the kit for upgrading bioreactors for bio-electrosynthesis.

Scientific contacts

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