

Preconditioning Operation of Membraneless Vanadium Micro Redox Flow Batteries



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Invited for this month's cover picture is the R&D Department of B5tec lead by Dr. Alberto Quintero. The cover picture shows the first membraneless micro flow battery prototype. Read the full text of the Research Article at 10.1002/batt.202300367.

What is the most significant result of this study?

On this research a membraneless micro flow battery with all components at micro scale is presented, not only the reactor as in previous state-of-the-art, but also actuators, sensors, and control electronics which make it fully independent of any macro device for its operation. The presented device could be considered the first fully automated micro chemical plant in history of science, and we hope that in future, more researchers inspired by this achievement will start to develop all kind of chemical industrial processes in automated micro plants. Operating parameters for Vanadium redox species preconditioning are stated as initial step for a future charge-discharge operation.



B5tec team

What was the inspiration for this cover design?

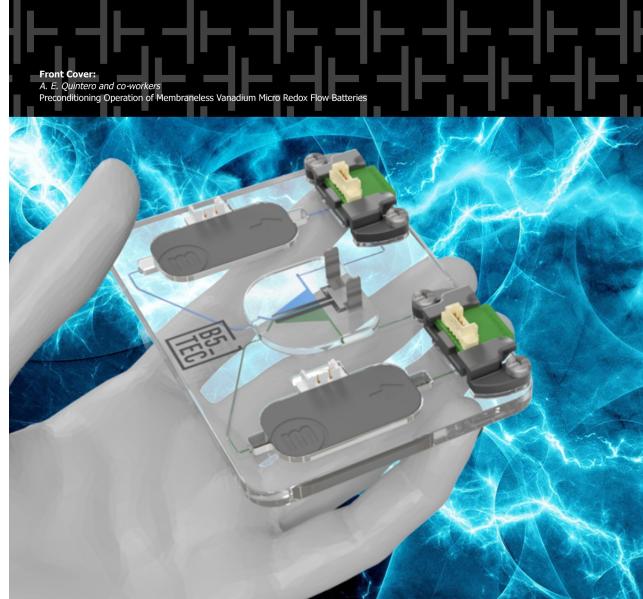
We present in the front cover image a prototype of the B5tec membraneless micro flow battery in one hand, as a tool to give the people an idea of its real size. Three-dimensional image was created by one of our colleagues at B5tec, Óscar Crespo Toca.

What was the biggest challenge (on the way to the results presented in this paper)?

When this project started 5 years ago, microfluidics was on a very early stage, and most of the solutions at that time did not fit our application. Specifically, a very precise solution to control the flow rate of recirculating co-laminar flows in microchannels was needed, and B5tec R&D department efforts allowed to

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Front Cover:
A. E. Quintero and co-workers
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overcome this challenge with a micro solution unique in the field.

What prompted you to investigate this topic/problem?

This is one of the commercial products at B5tec, which is a start-up focused on developing energy storage solutions through disruptive technologies, such as microfluidics, for the green-energy future. B5tec's goal of down scaling flow battery technology is to improve its performance. Specifically on this

project B5tec has been collaborating since the beginning of the project with University Carlos III of Madrid Fluid Mechanics group lead by Dr. Marcos Vera Coello, Electrochemical Processes Unit of Imdea Energy Research Institute from Spain lead by Dr. Jesus Palma, and with Simon Fraser University Fuel Cell Research Lab in Canada lead by Prof. Dr. Erik Kjeang, as advisors for the development of the technology.