

**DEPARTMENT OF MECHANICAL ENGINEERING****SEMINAR****Online**

Title: Flexible High Performance Direct Formate Paper Fuel Cells Fabricated by 3-D Printing

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Date: 24th February, 2021 (Wednesday)

Time: 4:00 p.m.

Zoom Link: 1) Link to join the meeting:

<https://hku.zoom.us/j/94064356550?pwd=YXpsUC9lMmhlc29hMVFUZHQzaDdwZz09>

2) Meeting ID: 940 6435 6550

3) Password: 871074

Abstract:

Paper-based microfluidic fuel cells are prominent in flexible electronics, including wearable and disposable devices, such as smart packages and point-of-care diagnostics. However, the performance is generally low, and the long-term durability is questionable. In this work, a flexible paper-based fuel cell was proposed with a novel cell architecture that adopts a single flow for the delivery of both the fuel and the supporting electrolyte. During cell operation, the anode is immersed in a liquid fuel with a supporting electrolyte, while the cathode is exposed to the ambient air. The performance of this cell is increased by one order of magnitude compared to the conventional co-flow cell architecture due to the enhanced mass transfer. A maximum power density of ~ 20 mW/cm² and a maximum current density of 122.9 mA/cm² are achieved, which are the highest among all reported paper-based direct formate fuel cells. Furthermore, this cell can steadily discharge at 5 mA cm⁻² for more than 10 days continuously, while the morphology of the anode and the cathode before and after cell operation remains unchanged. Finally, this paper-based fuel cell can be efficiently fabricated by 3D printing, which is simple, low cost, and advantageous for paper-based fuel cell fabrication.

ALL INTERESTED ARE WELCOME

For further information, please contact Prof. D.Y.C. Leung at 3917 7911.