

Organic vapor jet printing with a microfluidic shutter

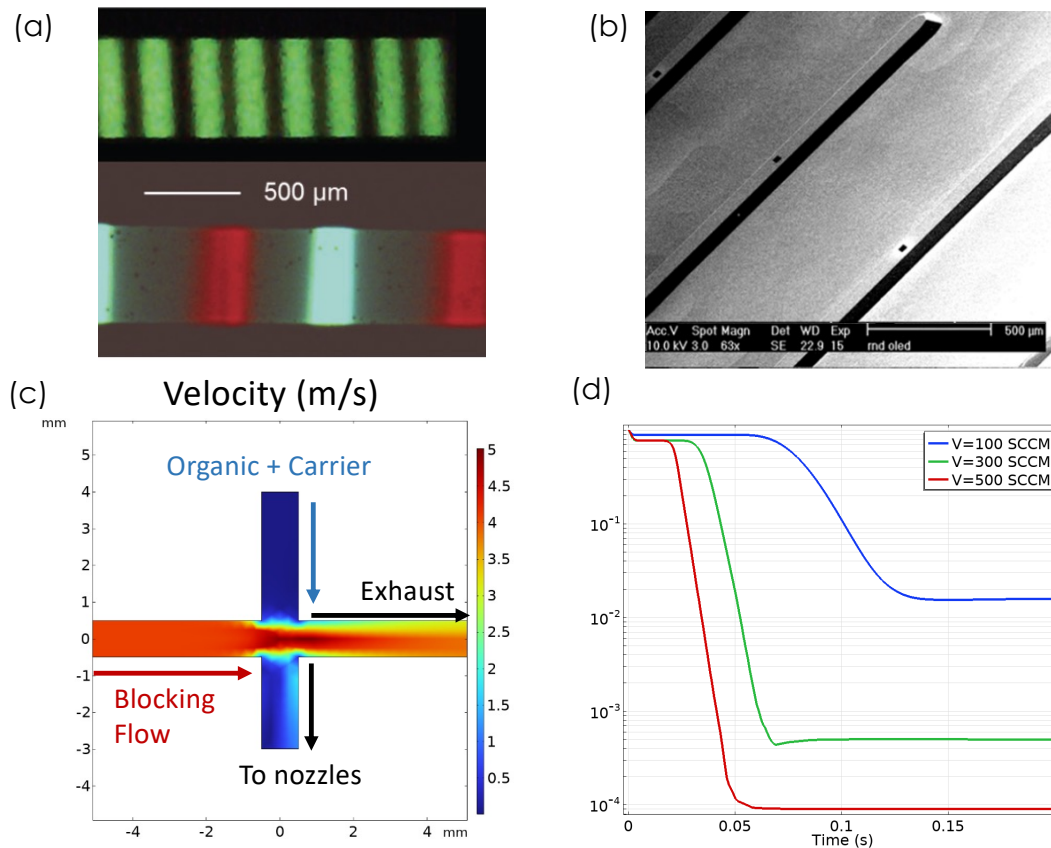


Figure: (a) Red and green pixels deposited by OVJP. (b) SEM image of a micronozzle array for OVJP. (c) Velocity plot of a blocking flow simulated at 500 SCCM. (d) Simulated organic concentration (arbitrary units) versus time at difference flow rates.

Objective

➤ To rapidly turn on and off the organic deposition in organic vapor jet printing (OVJP), enabling the deposition of arbitrary patterns

Impact

OVJP is a mask-free method of depositing organic molecules at a very high rate. Organic materials are evaporated, entrained in an inert gas, and channeled through a micronozzle array to print features as small as 10 μm at rates as high as 80 nm/s. However, even if the flow of inert carrier is shut off, OVJP continues to deposit. Our solution is to integrate a microfluidic valve and a blocking gas to redirect the organic mixture away from the nozzle array.

Facilities and Methods Used

- LNF facilities
- LSA Scientific Instruments Shop

Relevant Papers

- G.J. McGraw, et Al., *Adv. Mater.* DOI: 10.1002/adma.201204410

Funding

- Universal Display Corporation

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