

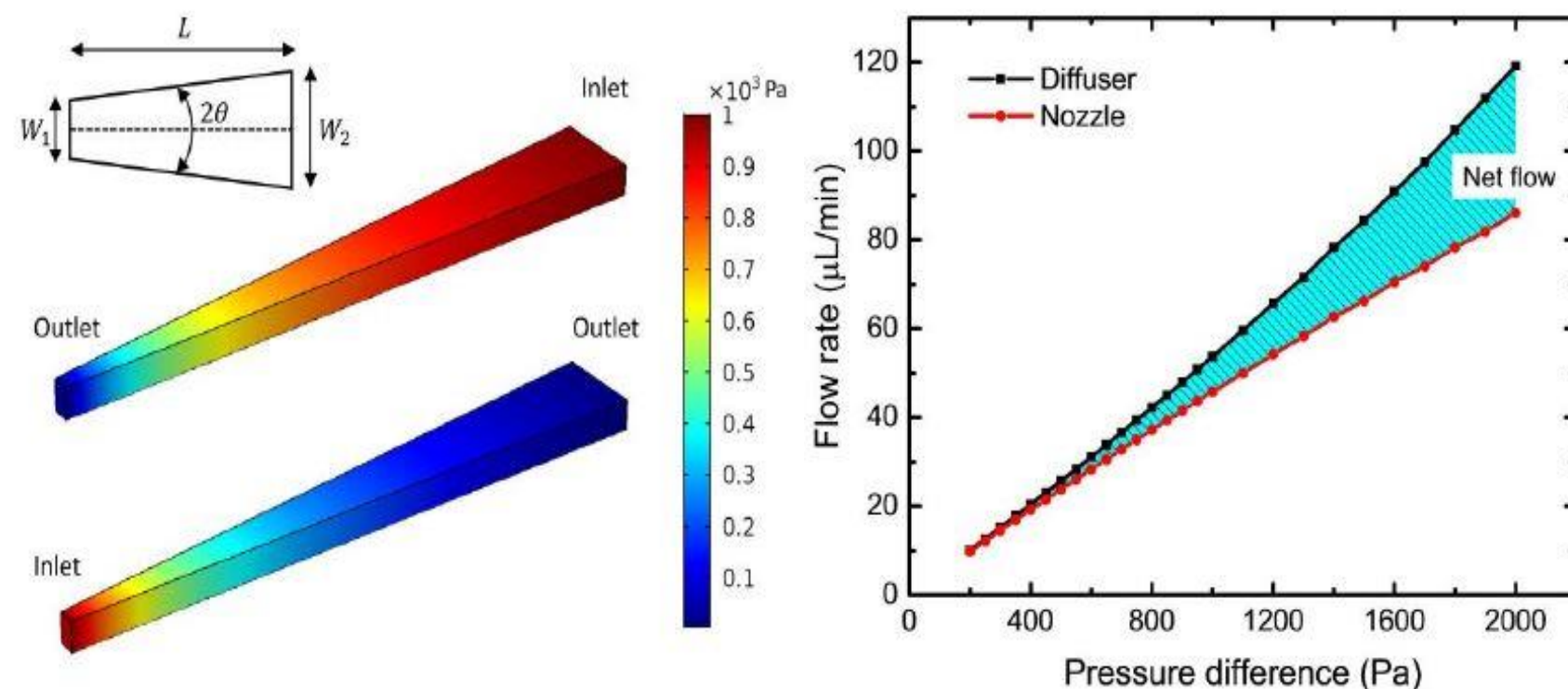


Simulation and Fabrication of Piezoelectrically Actuated Nozzle/Diffuser Micropump

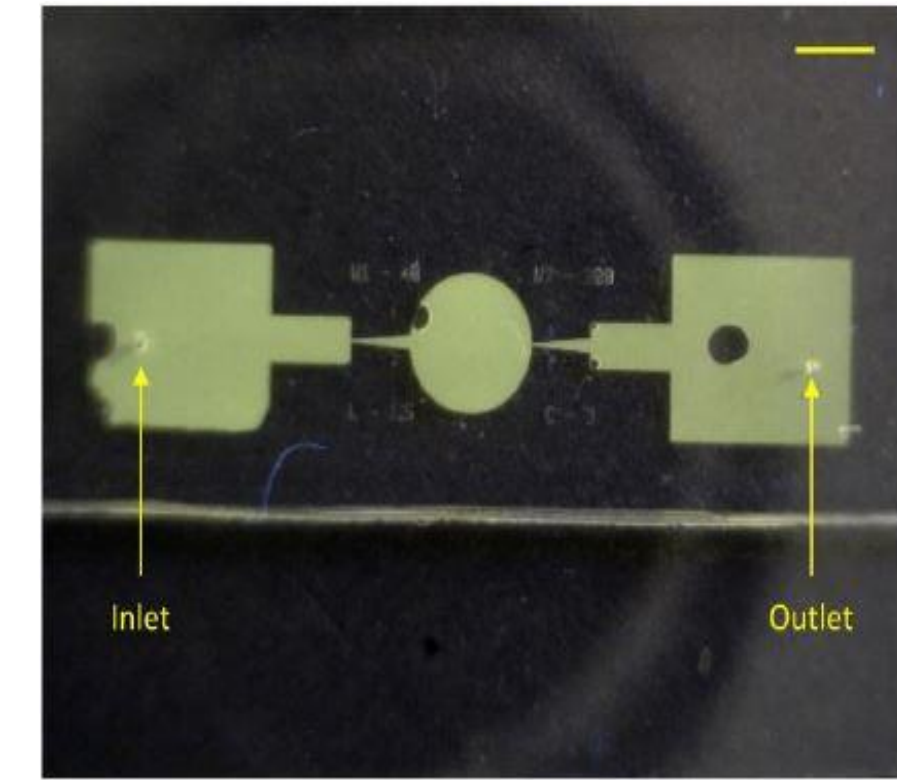
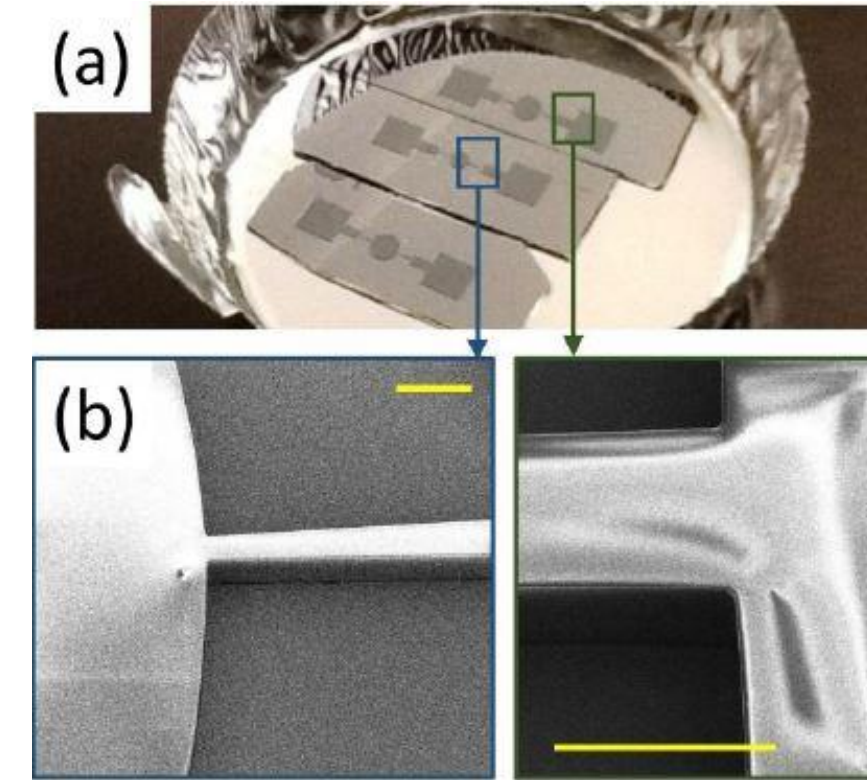
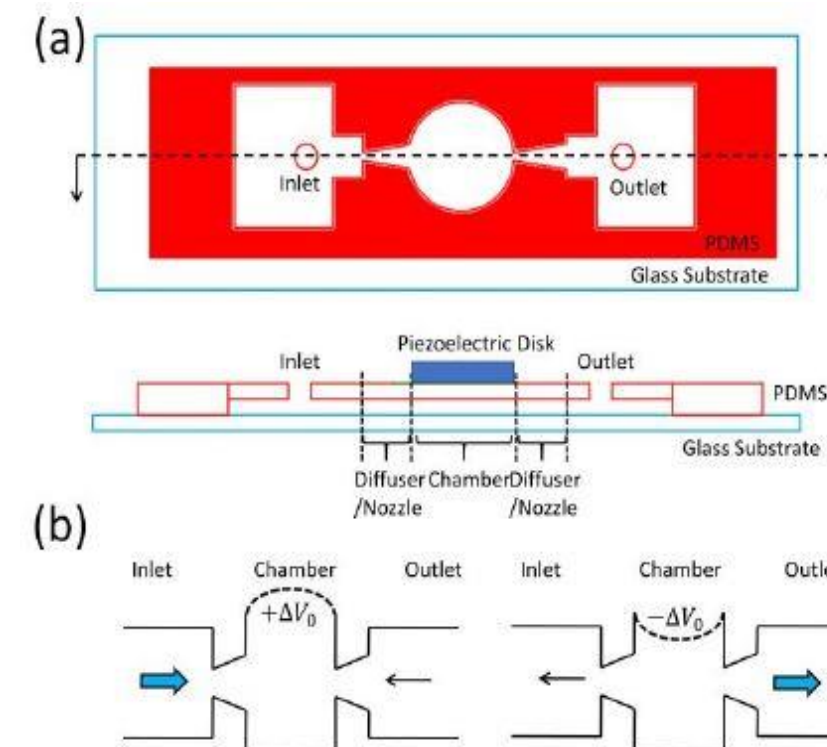
ABSTRACT :

Micropumps are Important parts of a microfluidic systems like Lab-on-Chip systems. A low-cost, structurally simple, piezoelectrically actuated micro-pump was simulated and fabricated using PDMS. The pump flow rate was measured to be $9.49\mu\text{L}/\text{min}$, $14.06\mu\text{L}/\text{min}$, $20.87\mu\text{L}/\text{min}$ for applied voltages of 12V, 14V, 16V respectively.

SIMULATION PROCESS :



FABRICATION PROCESS :



RESULTS & CONCLUSION:

In this work, micro-pump with flowrate of $10\mu\text{L}/\text{min}$ at applied voltage of 12 V was fabricated. The pump efficiency was calculated to be 1.642, while the rectification factor was calculated to be 12.33%. The chamber pressure was found to be in the range 1.1 to 1.5 kPa.

