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**Micro/nanofluidic Diode using Asymmetric Ion Concentration Polarization Layer** SEOYUN SOHN, INHEE CHO, SUNG JAE KIM, Seoul National University — Recent developments of ion concentration polarization (ICP) theory would suggest that an over-limiting conductance (OLC) of the device is subject to the morphology of ICP layer and a micro-structure is able to alter the morphology. In this study, we demonstrated an ion rectification resulted only from asymmetric microscale structures, while conventional nanofluidic diode applications have usually employed a nanoscale asymmetry which requires sophisticate and expensive fabrication processes. We designed two dead-end microchannels incorporated with the nanoporous membrane. The difference in width of the microchannels was designed to yield asymmetry to the device. Cyclic voltammetry measurement was conducted to investigate the OLC behaviors on both forward and reverse bias. The diodic characteristics on I-V responses were observed at various ratio of the different microchannel width. In addition, we experimentally verified the logarithmical linearity between the ratios and the rectification ratios of OLC. This quantitative analysis would guide the further application utilizing microscale asymmetric diode device that now can be realized with minimum fabrication endeavors.

Inhee Cho
Seoul National University

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