

Abstract

A micro bubble separator capable of multi-directional bubble exhaustion is designed, fabricated, and tested. The bubble separator fabricated on a piece of water using MEMS fabrication process includes a flat region and a microchannel region. In the flat region, there are a matrix of micro holes with hydrophobic inner surface. The microchannel region contains a set of alternating gas and liquid microchannels. Within the gas microchannels, the microholes is further made. The liquid microchannels are hydrophilic, while the gas microchannels, and the micro hole therein are hydrophobic. This bubble separator was experimentally demonstrated to exhale bubbles in multiple directions successfully with fuel recycle capability. Such bubble separators are suitable to deal with the CO₂ bubbles generated at the anode of a micro direct methanol fuel cell (μ DMFC).

