Disposable polymeric electromagnetic actuated micropump

Abstract

A polymer based disposable micropump was designed and evaluated for drug release and control mechanism. The micropump is constructed via hot embossing replication technique with poly(methylmethacrylate) as body structure material and poly(dimethylsiloxane) as membrane. To optimize the membrane material selection in term of deflection and stress distribution, finite element method (FEM) structural analysis was carried out. Under same condition, the behavior of the PDMS polymer is investigated on the thickness and radius variation. The fabricated polymer type micropump ensures 0.0025 liters/min of flow rate with 15 mm H_2O back pressure at 29 Hz.