URN etd-0407109-183701-17
Author Tang-Yuan Chen
Author's Email Address No Public.
Statistics This thesis had been viewed 64 times. Download 177 times.
Department
Year 2005
Semester 1
Degree Master
Type of Document Master's Thesis
Language zh-TW.Big5 Chinese
Title Low-Temperature Bonding Technique for Plastic Microfluidic Chips and its Applications on Plastic Diffuser Micropumps
Date of Defense 0000-00-00
Page Count 64
Keyword
PMMA bond
Plastic diffuser icropumps

Abstract
A new technique for bonding of polymer micro-fluidic devices has been developed. This method can easily bond biochips with complex patterns. By using a patterned Ni mold, the micro-channel structures on Poly-Methyl Meth-Acrylate (PMMA) substrates were generated by one-step hot embossing procedure and bonding of low temperature. In contrast with the traditional thermal bonding, the method presents low-temperature and low-pressure packaging for polymer micro-fluidic platforms. Furthermore, the tensile strength of the disposable plastic biochip was 179 kgf., which is 2 to 15 times greater than that of conventional methods. This paper also applied this technique on plastic diffuser micro-pumps, based on piezoelectric actuation. The pump was made of -PMMA, and the diameter and depth of the pump chamber was 6 mm and 200 mm, respectively. The working fluid was non-degassed de-ionized (DI) water. The flow rate of 53.6 ml/min was obtained at a 100 Vpp and 400 Hz square wave drivin g signal.
Advisory Committee Yi-Chu Hsu - advisor

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etd-0407109-183701-17-002.pdf

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Date of Submission 2006-08-23