Photo-Patternable and Adhesive Polymer for Wafer-Scale Microfluidic Device Fabrication

ウェーハスケール・マイクロ流路デバイス製作のための感光性接着剤

JSR 株式会社研究開発部 ○稗田克彦 1

JSR Corporation1, R&D department, 1Katsuhiko Hieda, Tom Miyazaki2, Sara Peters2, Paru Deshpande3, Liesbet Lagae3, John O’Callghan3, Josine Loo3, Chengxun Liu3, Bivragh Majeed3, and Jans Karolien3, JSR Micro NV2, IMEC3

E-mail: katsuhiko_hieda@jsr.co.jp

Abstract

A novel photo-patternable and adhesive material for wafer-scale microfluidic devices by simple process steps using photolithographic technique and thermal bonding has been developed. We here report feasibility of such wafer-scale process for bio-MEMS lab-on-chip application.

Wafer-Scale microfluidic fabrication

Our fabrication process is described in Fig. 1. Photolithographic process takes place by spin-coating, exposure, and development (2.38wt% TMAH) to realize desired microfluidic structures. SEM image shows smooth and clean polymer surface in Fig. 2. Finally, microfluidic structure was successfully fabricated on 8-inch wafer to demonstrate feasibility of production.

Summary

We have introduced a photo-patternable & adhesive polymer and demonstrated fabrication of microfluidic structure and attachment of glass cover in simple lithography and thermal bonding process. The method is applicable to wafer-scale process and suitable for wafer-level production. We believe the material is a promising solution to polymer microfluidics in bio-MEMS lab-on-chip technology.

Fig.1 wafer-scale fabrication steps. Fig.2 Microfluidic structure using photolithography.