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Micromachining Technology and Biosystems

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1. _____

가 가

가

가 (drug delivery system), 가 (lab on a chip), 가 (micro total analysis system)

가

, 2 가

, quartz,

. 3

4

2. _____ 가

2.1

가

가

MEMS

. MEMS

가

, 가

. MEMS

가

가 (bulk micromachining),

가 (surface micromachining)

(high aspect ratio structure)

가

가

가

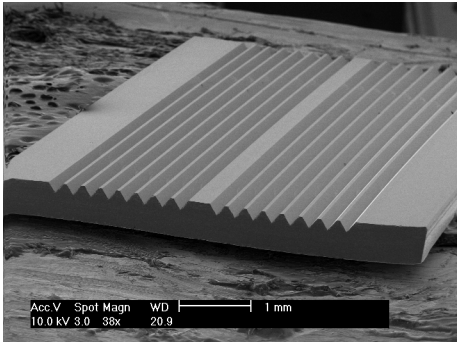
1 (ㄱ)

, 1 (ㄴ)

Sandia Lab.

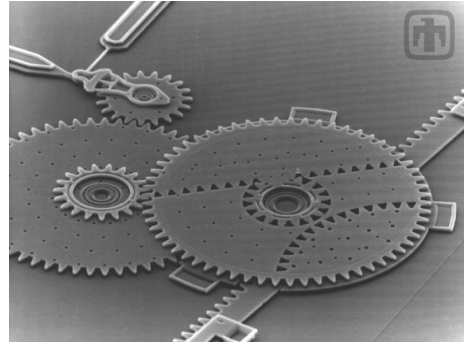
4

가 [1-3].



(ㄱ)

가



(ㄴ)

가

[Sandia Lab., <http://www.sandia.gov>]

가

1.

2.2

, quartz,

가

가

가

가

, quartz

quartz

. Polydimethylsiloxane (PDMS), Polymethylmethacrylate (PMMA), Polyurethane (PU), Polycarbonate (PC) 가 가 (micromolding) 가 (micro forming, hot embossing)

가 PDMS, PU

가

PMMA, PU, PC

가

2 (ㄱ)

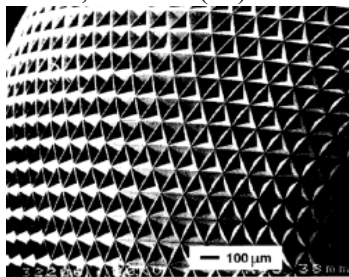
Harvard

가

replica molding

PU

2 (ㄴ)



(ㄱ)

가

PU

[Harvard university]

2.

(ㄴ)

가

[

]

가

3.

가

가

. Affymetrix, Nanogen, Cepheid, Orchid, Aclara, Caliper, Agilent

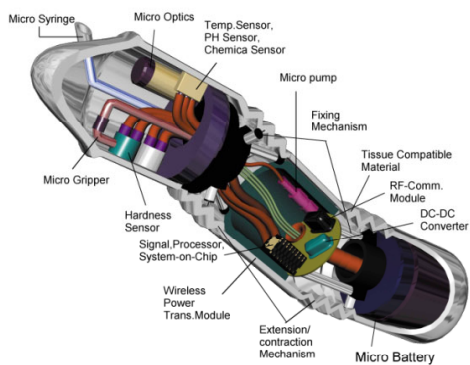
DNA , ,

3

가

[4].

가



3. 가

4 (ㄱ)

가

4 (ㄴ)

5

PDMS

[5].

quartz
가

CE (capillary electrophoresis)

6

PDMS

[6]. 6 (ㄱ)

PDMS

, 6 (ㄴ)

6 (ㄷ)

6 (ㄹ)

[6].

4.

가

, quartz,

가

가

가

가

가

가

가

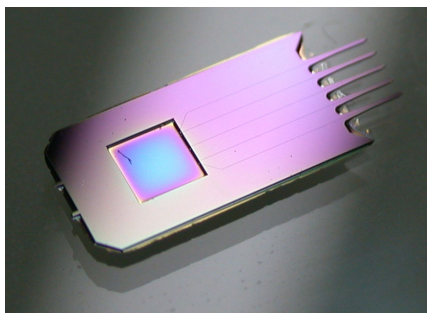
가

가

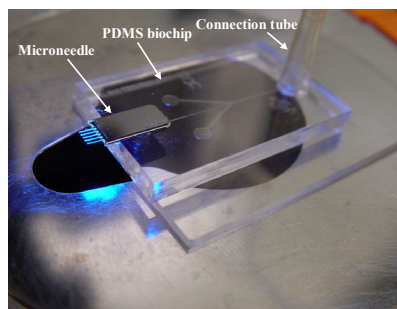
가

가

가

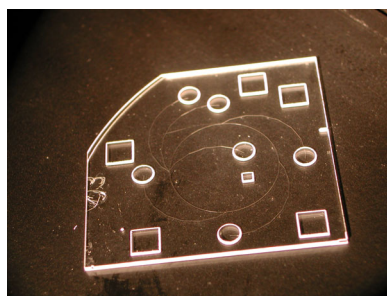


(ㄱ)



(ㄴ) PDMS

4. 가

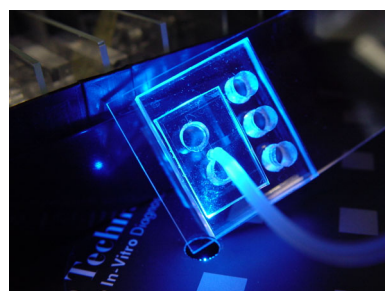


5. quartz

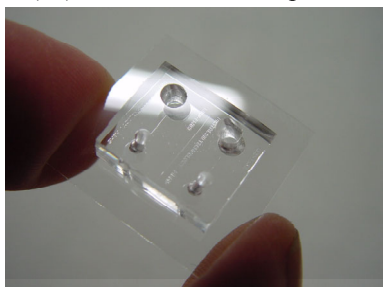
CE



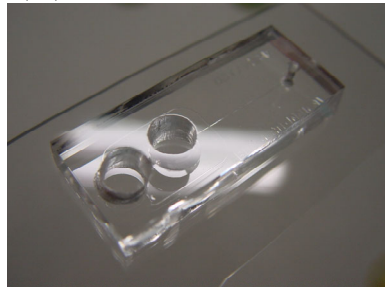
(ㄷ) Serial dilution titer palette



(ㄹ)



(ㄺ) hemocytometer
6. PDMS



(ㄻ)

[1] S. Lee et al., Dig. Pap. Microprocess and Nanotechnology Conf., 1998.
 [2] S. Lee et al., IEEE/ASME J. Microelectromech. Syst., 8(4), 1999.
 [3] G. T. A. Kovacs, Micromachined transducers – sourcebook, McGraw-Hill, 1998
 [4] (<http://www.microsystem.re.kr>)
 [5] S.-J. Paik et al., Pac. Rim. Workshop on Transducers and Micro/Nano Technologies, 2002
 [6] 1 – BioMEMS , 2001