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LIGA

(SU8) (MEMS)

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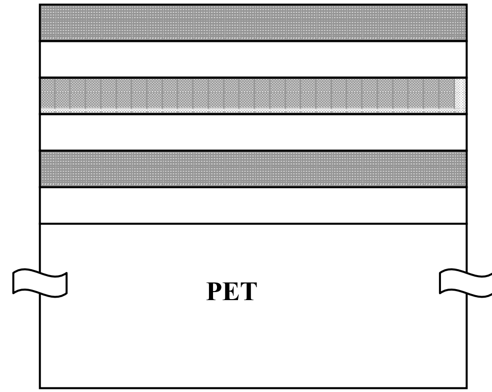

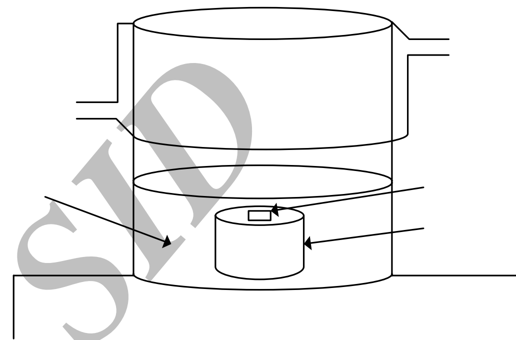

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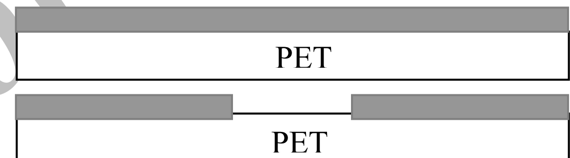

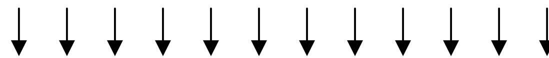

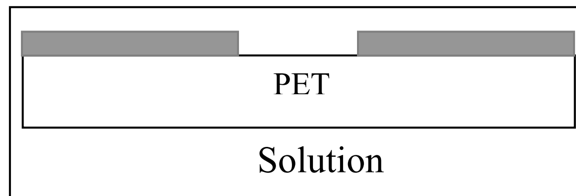

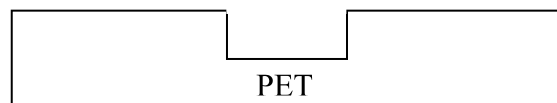

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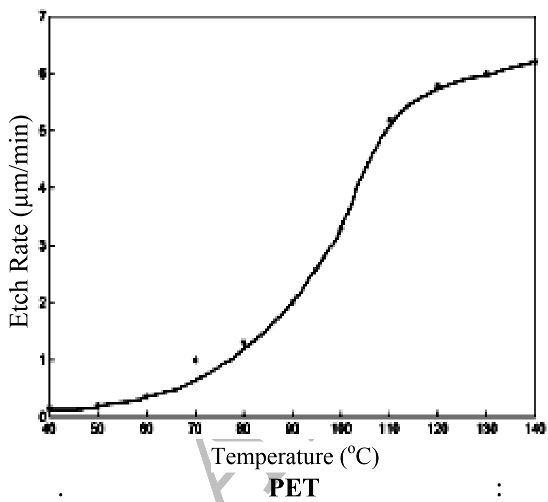

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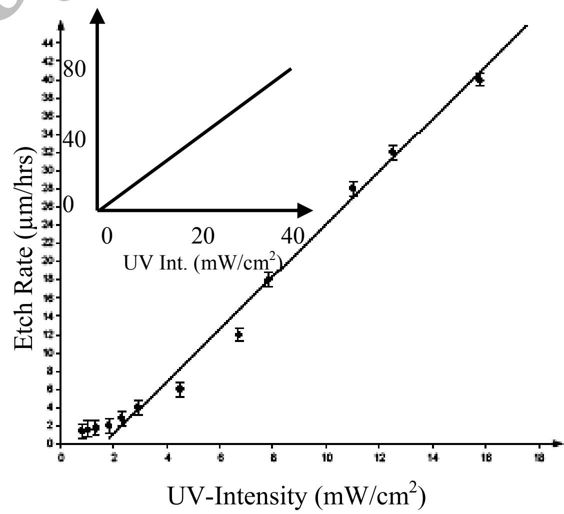

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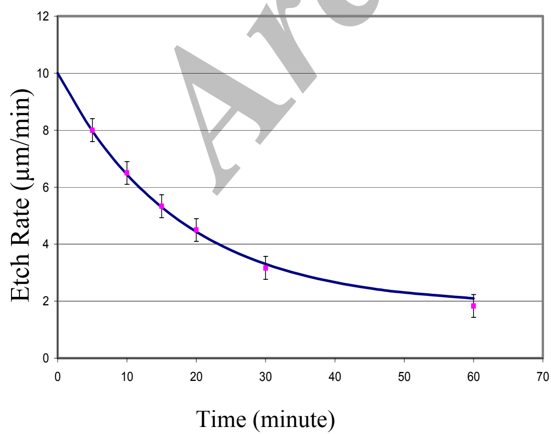

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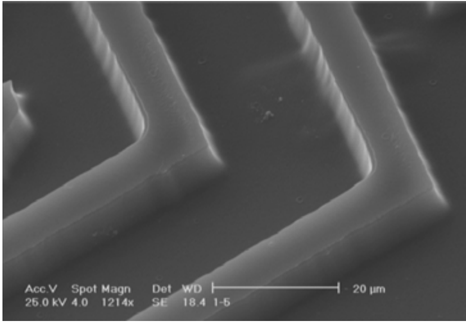

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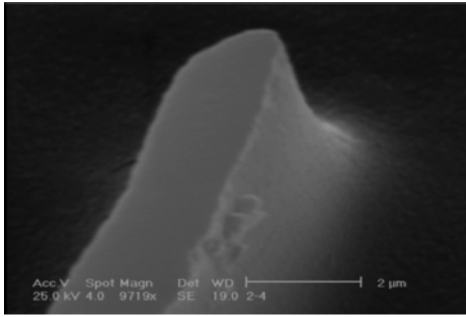

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$$R(t)= (R_0 - R_\infty) \exp(-t/\tau) + R_\infty$$

"t" $R(t)$

τ R_∞ R_0

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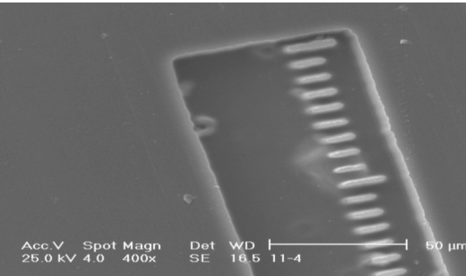

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/ R_∞ R_0

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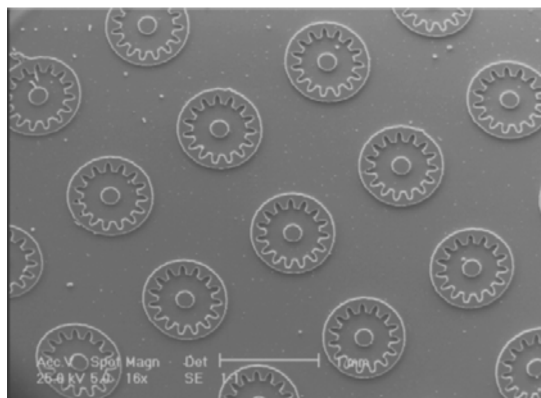

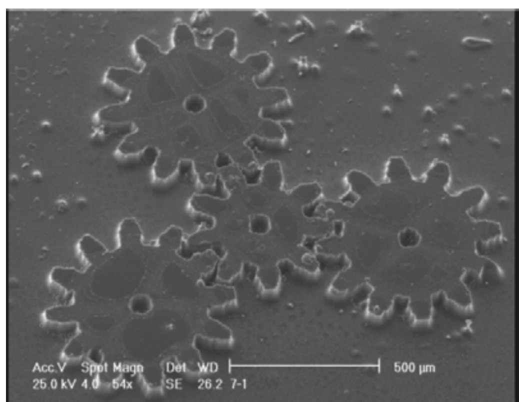

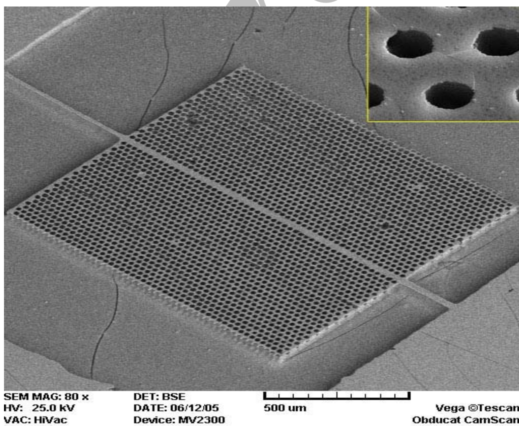

(Dek-Tak 3B)

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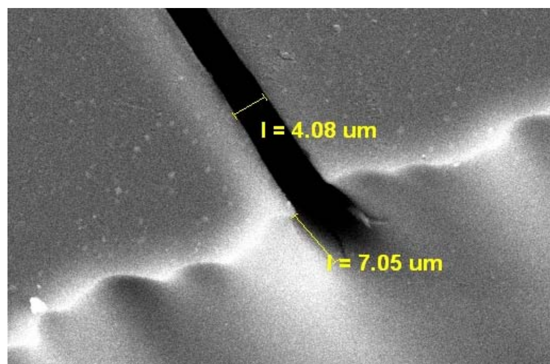

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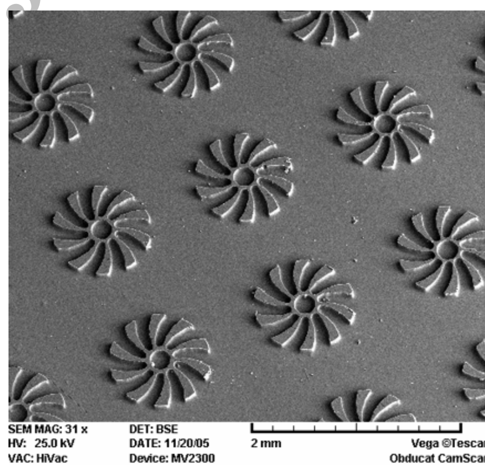

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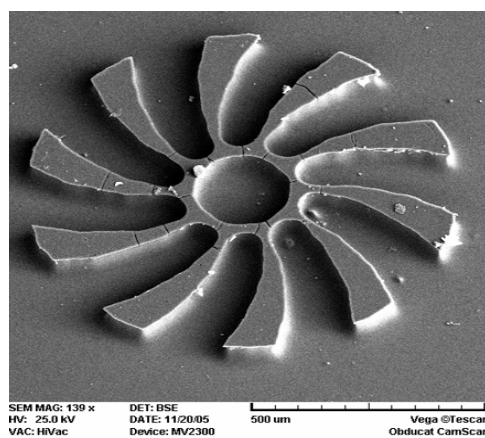

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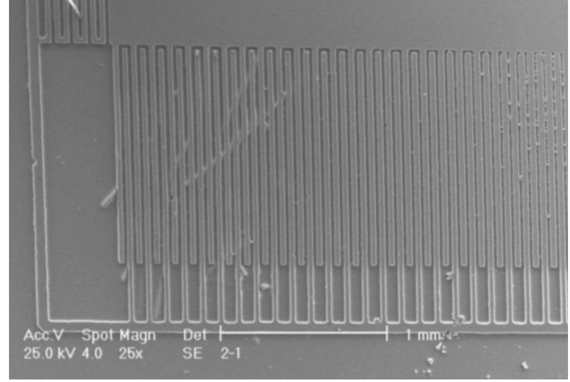

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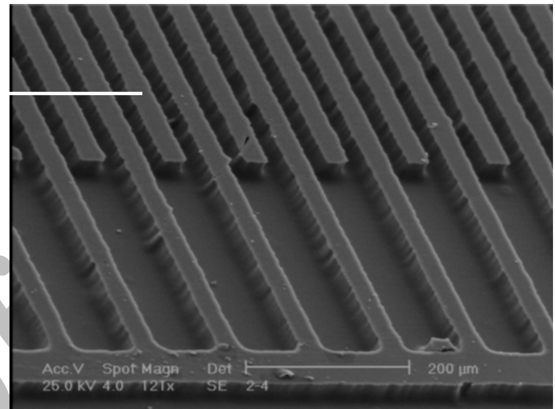

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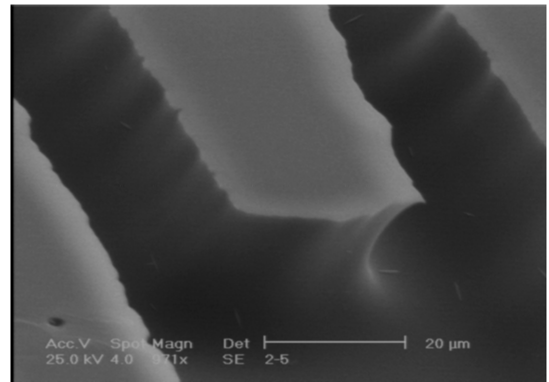

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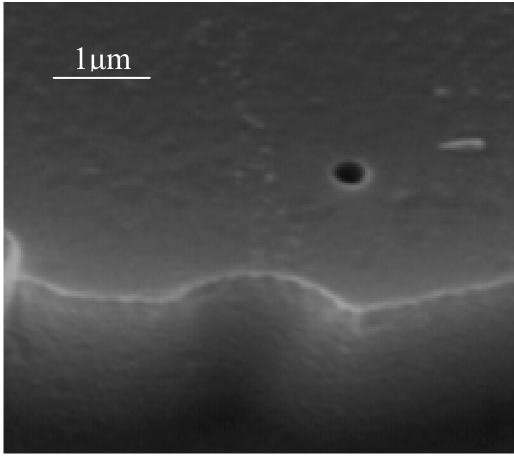

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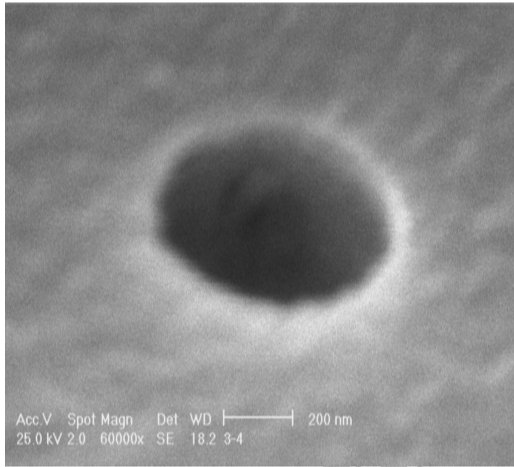

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1 - Alavi, M., Schumacher, A. and Wagner, H. J. (1991). "Laser machining and anisotropic etching of <111> silicon for applications in Microsystems." *In Proc. Micro Syst. Technol.,* PP. 227–231.

2 - Wensink, H., de Boer, M. J., Wiegerink, R. J., Zwijze, R. A. F. and Elwenspoek, M. C. (1998). "First micromachined silicon load cell for loads up to 1000 kg." *Proc. SPIE, Micromach. Devices Comp. IV,* Vol. 3514, PP. 424–430.

3 - Berenschot, J. W., Oosterbroek, R. E., Lammerink, T. S. J. and El-wenspoek, M. C. (1998). "Micromachining of <111> plates in <001> oriented silicon." *J. Micromech. Microeng.,* Vol. 8, PP. 104–107.

4 - Gui-Zhen Yan; Chan, P.C.H.; I-Ming Hsing; Sharma, R.K.; Sin, J.K.O. (2000). "An improved TMAH Si-etching solution without attacking exposed aluminum." *Micro Electro Mechanical Systems,* 2000. MEMS 2000. The Thirteenth Annual International Conference on 23-27 Jan. P(s).562 – 567.

Archive of SID

www.SID.ir

5 - Cristea, D., Purica, M., Manea, E. and Avramescu, V. (2002). "Experiments for micro-photonic components fabrication using Si<111> etching techniques." *Sensors and Actuators A 99*, PP. 92-97.

6 - Cristea, D., Muller, R., Arguel, P., Kusko, M., Tibeica, C. and Syvridis, D. "Micromachined tunable optical microfilters design and experimental processing." (2004). *Proceedings of SPIE, the International Society for Optical Engineering, v 5455, MEM, MOEMS, and Micromachining,* PP. 252-263.

7 - Sammak, A., Azimi, S., Khadem-Hoseini, B., Izadi, N. and Mohajerzadeh, S. (2007). "Deep vertical etching of silicon wafers using a hydrogenation assisted reactive ion etching." *Accepted for publication in IEEE Journal of MEMS.*

8 - Dreuth, H. and Hieden, C. (1999). *Thermoplastic structuring of thin polymer films, Sensor and Actuators A* 78, PP.198–204.

9 - Roberts, M.A., Rossier, J., Bercier, P. and Girault, H. (1997). "UV laser machined polymer substrates for the development of micro diagnostic systems." *Anal. Chem. 69*, PP. 2035–2042.

10 - Francou, M., Danel, J. S. and Peccoud, L. (1995). "Deep and fast plasma etching for silicon micromachining." *Sensors and Actuators A 46-47*, PP. 17-21.

11 - Rossier, J. S., Vollet, C., Carnal, A., Lagger, G., Gobry, V., Girault, H.H., Michel, P., Reymond, F. et al. (2002). *Plasma etched polymers microelectronical systems, LAB Chip 2*, PP.145–150.

12 - Maleki, T., Mohajerzadeh, S. and Afzali-Kusha, A. (2003). "Plastic micromachining assisted by ultraviolet illumination." *IEEE Trans. Electron Devices*, Vol. 50, No. 8, PP.1813–1815.

13 - Sadeghi, B., Ghafouri-Fard, M.R., Mohajerzadeh, S., Miri, M., Mohammadi, S. and Asl. Soleimani, E. (2004). "A novel ultra-violet assisted anisotropic etching of plastic to realize micro-gears." *Sensors and Actuators,* A.

1 - UV-curable adhesive
2 - Poly-Ethylene Terephtalate
3 - Di-Methyl-Formamide
4 - Di-Chloromethane

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