Microfabrication

Research Topics 1999

SU-8 Ablation for Rapid High Aspect Ratio 3D Microfabrication

Collaborating Organisations:

RMIT University

Objectives

To produce high aspect ratio three dimensional microstructures by direct ablation of SU-8 photoresist, and to demonstrate electroplating and subsequent cleaning of the microstructure using excimer lasers radiation.

Expected Outcomes

SU-8, supplied my MicroChem Corp (http://www.microchem.com), is a popular resist for high aspect ratio microfabrication since it can be spun to large thickensses (~100 microns) and is transparent allowing deep I-line UV exposure. SU-8 has one outstanding drawback – it is difficult to strip. We have shown that excimer laser ablation of SU-8 is rapid and clean and independent of the bake temperatures applied to the SU-8. It machines at fluences that are low enough to prevent damage to silicon substrates, metal seed layers more than 1 micron thick, and electroplated nickel and permalloy.

Researcher

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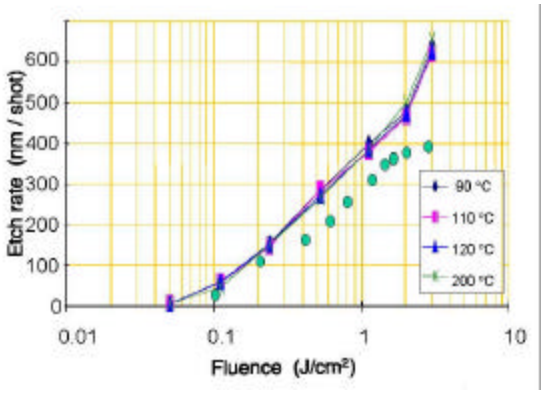
Microgear mould laser ablated into 60 micron thick SU-8. Aspect ratio 4.5



Etch rate curve for SU-8. Green points for Polyimide.