Comparison study of dry resist strippers during high aspect ratio test probe fabrication

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Abstract

Photoresist is commonly used to fabricate microstructures by electroplating. However, the removal of the photoresist inside high aspect ratio trenches or small plugs can pose challenges. A comparison study is conducted between two strippers, NF-90 and NaOH 3% solution, for dry photoresist stripping. NF-90 is a stripper comprised of DMSO and Diglycolamine as the main active ingredient.

The stripping mechanism of NF-90 is dissolution as opposed to swelling and fracture observed in NaOH solution. At 55 C, the dry resist soaked in NF-90 initially swells in volume, up to 120%, then gradually shrinks as a result of dissolution. After 30 minutes, the volume drops below 20% of the original resist, and no resist residue remains attached to the surface. On the other hand, for the NaOH solution, prolonged soak did not remove the resist completely.

Gas chromatography - mass spectrometer characterization was done on the resist stripped with NF-90 and NaOH solution to observe the volatile organic compounds (VOC) during stripping. With NF-90 , DMSO and Diglycolamine are initially absorbed by the resist, then multiple compounds are removed by dissolution, possibly explaining the volume reduction. On the other hand, NaOH solution does not show any significant removal of the VOCs.

Please contact the author for additional information.