

Etching solutions

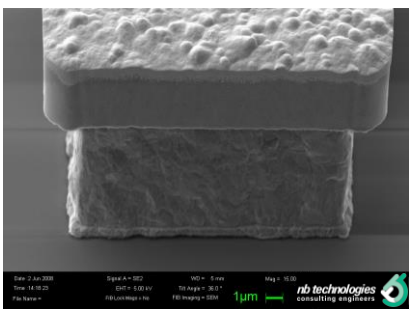
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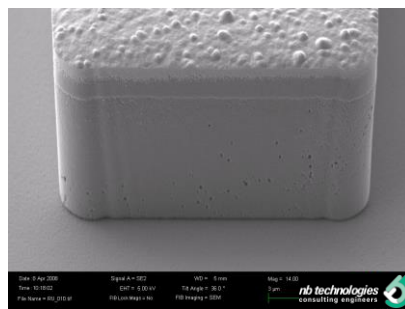
NBT has designed etching chemicals for the removal or patterning of metals, sacrificial layers or seed layers for electroplating. The difference in requirements is whether the seed needs to be **removed after plating** with selectivity to all other materials and least dimension loss, or if the seed needs to be **patterned before plating**, which requires compatibility with masking resists.



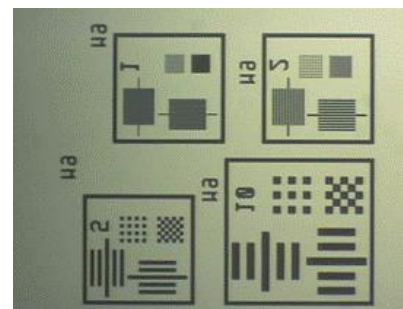
Etchant	Application	Features
Au etch 200	Seed <u>patterning/removal</u>	Non-toxic, cyanide-free , very small undercut , resist compatible, selectivity to many metals and materials like Ni, Cr, Ti, Al, Ta, Pt ; (Cu is etched) ; 50°C
Au etch 300	Bulk etching Seed <u>patterning/removal</u>	Non-toxic iodine-based , easy application, resist compatible, significant undercut, (limited) selectivity to plated metals like Cr, Ti; (Ni and Cu are attacked)
Cr etch 200	Adhesion layer <u>patterning</u> (resist mask)	Alkaline solution, compatible with resist for patterning , RT, good selectivity to many metals like Au, Pt, Ta, Ti, Ni, Cu; (Ag is etched)
TiW etch 100	Barrier layer <u>removal</u>	Compatible with resist , low undercut, contains fluoride, RT, selectivity to many metals and materials like Au, Ni, Cr, Sn; (Al and Cu with limitation)
TiW etch 200	Barrier layer <u>patterning</u> (resist mask)	Compatible with resist , low undercut, no fluorides , RT, selectivity to many metals and materials like Au, Cr, Ni ; (Cu is etched)
Cu etch 100	Sacrificial layer removal	Alkaline etchant, compatible with resist for patterning or etching thick Cu layers , high undercut , RT, selective to Ni, Au, Ag, Al, Sn, Ti, Ta, Cr, Si, Si ₂ N ₄ , SiO ₂
Cu etch 150	Seed <u>patterning/removal</u>	Alkaline etchant, compatible with resist (e.g. Cu seed layers) selective to Ni, Au, Ag, Al, Sn, Ti, Ta, Cr, Si, Si ₂ N ₄ , SiO ₂
Cu etch 200 UBM	Seed <u>patterning</u> (resist mask)	Patterning of thin Cu layers , low undercut , compatible with resist, RT, selective to Au, Ni, Cr, Ti, Ta, Sn, Al, Pt)
AX 100	Activator for plating of nickel on nickel	Acidic pre-dip solution, 40°C application, improves significantly adhesion, where nickel is plated on nickel



Etching TiW after plating
Plated Cu/Ni/Au on TiW/Cu seed
No undercut of TiW
Least dimension loss of Cu (~1µm)



Etching Cu seed after plating
Plated Cu/Ni/Au on TiW/Cu seed
No dimension loss of plated Cu



Patterning before plating
Cr/Au seed from the backside of glass wafer
Least undercut, 1µm feature resolved

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