

## **Defect-free Cu Layers for Interconnects by Electrodeposition**

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Electromigration is a degradation process in the interconnects on computer chips and this problem is a major roadblock towards their further miniaturization. The mechanism of this process is not well understood but it starts from preexisting defects. It is the dominant cause of long-term failure of computer chips. Improvements on this front will have a tremendous economic potential.

A proper understanding of these processes would have to be based on experiments with well-defined and controlled defects. We will make such tiny cables from virtually defect-free material and then deliberately introduce individual defects in a controlled way in order to understand the degradation processes and find ways to avoid them. We have demonstrated that we have the capability of making such defect-free materials using electrodeposition of Ni. The plan is to use copper, the material preferred by industry, to obtain such a superior material quality. Once achieved, we will use this for the detailed electromigration studies.