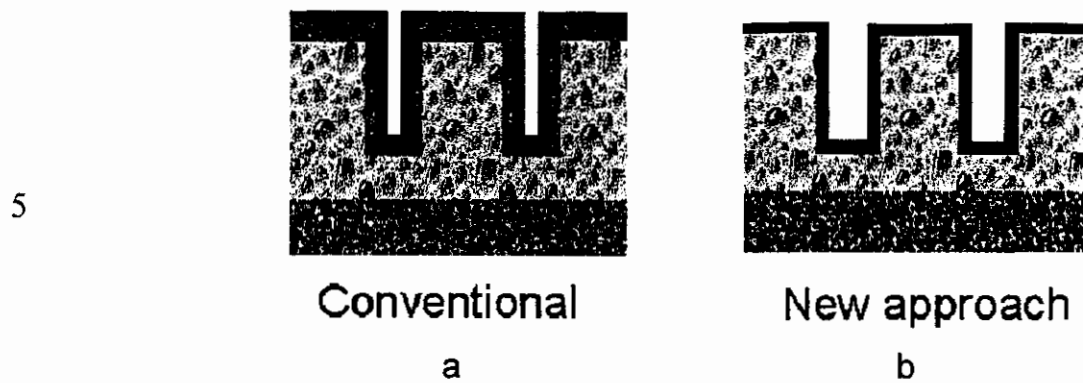
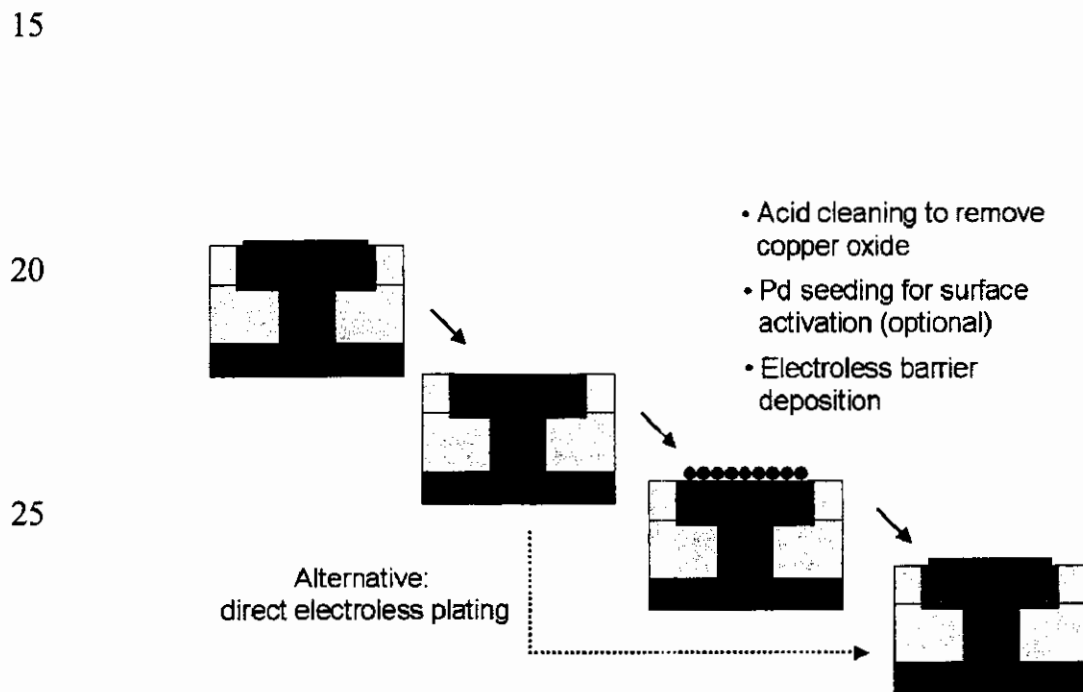




10

Figure 1: Diagrammatic representation of conventional Cu metallisation method (a) and combined diffusion barrier and nucleation layer (b)



30

Figure 2: Diagrammatic representation of the selective encapsulation process on Cu surfaces via Pd nuclei activation or by the direct route without the intermediate step of Pd nucleus activation including surface pretreatment

35

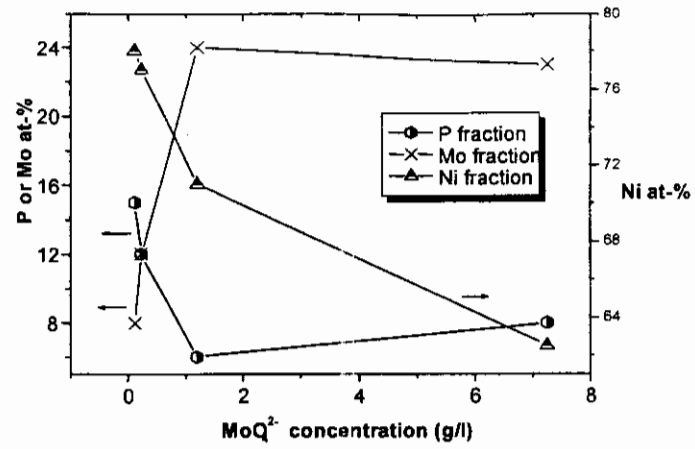


Figure 3: Effect of the concentration of sodium molybdate on the elemental composition of NiMoP three-component thin films

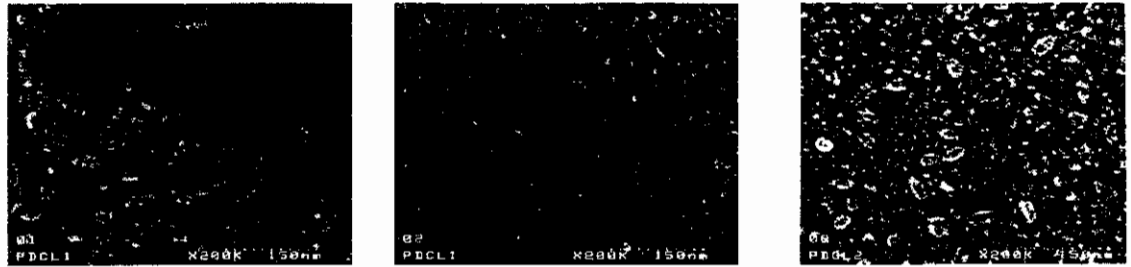


Figure 4: Cu substrate without post-CMP cleaning (a), Cu substrate cleaned for 2 minutes (b) and Cu substrate after cleaning for 2 minutes Pd activation for 10 seconds

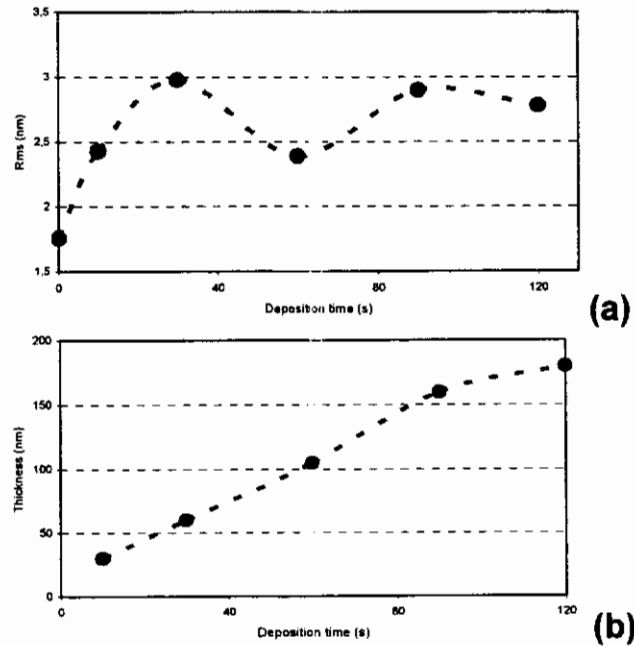


Figure 5: Roughness (a) and thickness (b) as a function of the deposition time

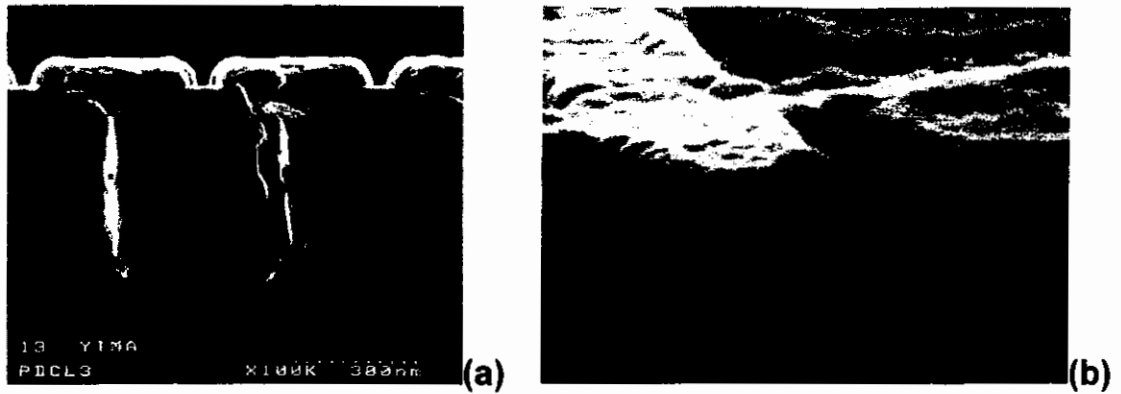


Figure 6: SEM photomicrographs of selectively encapsulated Cu damascene structures with Pd activation (a) and without Pd activation (b)

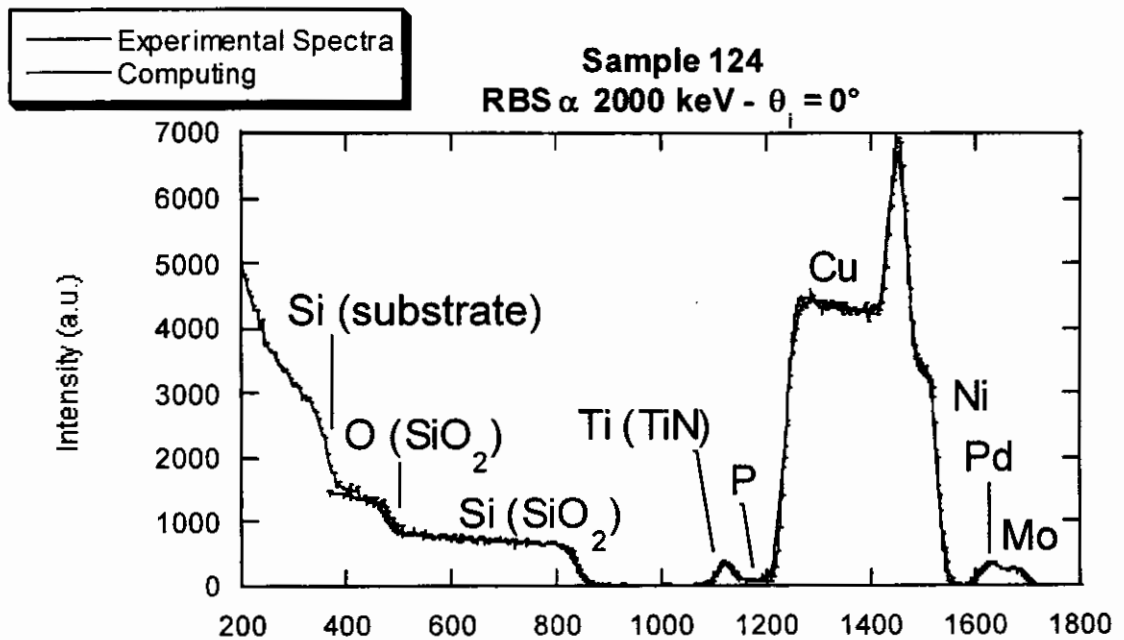


Figure 7: Composition of the deposited NiMoP layer of base electrolyte 1 with addition of 3.75 ppm of DTDGS and 75 ppm of Brij 58