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(54) Title: METHOD AND COMPOSITIONS FOR DIRECT COPPER PLATING AND FILLING TO FORM INTERCONNECTS
IN THE FABRICATION OF SEMICONDUCTOR DEVICES

(57) Abstract: The object of the present invention is a method and compositions for direct copper plating and filling to form inter-
connects in the fabrication of semiconductor devices. According to the invention, this method comprises : providing an electrolytic
copper bath containing, in solution in a solvent, a source of copper ions with a concentration of between 45 and 200 mM, preferably
of between 45 and 100 mM and at least one copper complexing agent which is an aliphatic polyamine having 2 to 4 amine functions
with a concentration of between 30 and 200 mM, preferably of between 60 and 200 mM; the copper/complexing agent (s) molar
ratio being of between 0.2 and 2, preferably between 0.3 and 1.5; bringing a copper diffusion barrier layer of a substrate into contact
with said electrolytic copper bath, applying an electrical bias to the substrate for a duration adjusted according to the thickness of
copper to be electroplated, removing the substrate from said electrolytic copper bath.



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