CLAIMS

1. An electrolyte having a pH being from 8.5 to 9.5, that is intended for electrodeposition of copper on a metal substrate, said electrolyte comprising, in an aqueous solution,

- from 0.4 to 50 mM of a mixture consisting of a first aromatic amine, a second aromatic amine and a complexing molecule,

the first aromatic amine being 2,2'-bipyridine, the second aromatic amine being imidazole, and the complexing molecule being tartrate or ethylenediamine; and

- from 0.4 to 50 mM of copper (II) ions that are in a complex form with the first aromatic amine, with the second aromatic amine and with the complexing molecule.

2. The electrolyte as claimed in claim 1, characterized in that the ratio between 2,2'-bipyridine molar concentration and imidazole molar concentration is from 1:2 to 2:1.

3. The electrolyte as claimed in claim 1 or 2, characterized in that the molar ratio between the first amine concentration and the complexing molecule concentration can be from 1/4 to 4/1, for example from 1/3 to 3/1, or from 1/2 to 2/1 ± 10%.

4. An electrochemical process for copper filling of patterns (1) that are hollowed-out in a dielectric substrate (2), and have at least one exposed surface (3) of a metal seed layer (4), wherein said patterns (1) have an opening (5) dimension that is less than 45 nm and a form factor that is higher than 2, said process comprising the steps of:

- bringing the exposed surface (3) into contact with an electrolyte as described in any one of claims 1 to 3, and

- polarizing the exposed surface (3) with a cathodic electric current and allowing the electrodeposition of copper onto the exposed surface (3), for a time sufficient to completely fill patterns (1) with a copper deposit (6) that comprises no void.

5. The electrochemical process as claimed in claim 4, characterized in that opening (5) dimension of patterns (1) is from 5 to 45 nm and a form factor being from 3:1 to 10:1.

6. The electrochemical process as claimed in claim 4, characterized in that a diffusion barrier layer (7) is interposed between the dielectric substrate (2) and the metal seed layer (4), said diffusion barrier layer (7) comprising at least one material selected from the group consisting of tantalum (Ta), titanium (Ti), tantalum nitride (TaN), titanium nitride (TiN), manganese (Mn) and tungsten (W).

7. The electrochemical process as claimed in claim 4, characterized in that cathodic electric current alternates a first intensity being from 0.33 mA/cm^2 to 1.67 mA/cm^2 at a frequency being between 1 Hz and 4 kHz, and a second intensity being equal to 0 mA/cm^2 at a frequency being between 0.5 Hz and 5 kHz.