In a particular embodiment of this electrolyte, the ratio between molar concentration of copper (II) ions and molar concentration of the mixture of imidazole and 2,2'-bipyridine is from 1/4 to 2/1.

The features as described below apply to any of the previously described electrolyte, if appropriate.

The complexing agent for copper (II) that is part of the electrolyte of the invention or part of the process of the invention for preparing the electrolyte can be selected in the group consisting of citric acid, tartaric acid, ethylenediaminetetraacetic acid (EDTA), N-(hydroxyethyl)-ethylenediaminetriacetic acid (HEDTA), ethylenediamine, 1,6 diamino-cyclohexane, diethylene-triamine, triethylene-tetramine, N,N,N,N-tetramethyl-ethylene-diamine, N,N-Bis(2-hydroxyethyl)ethylenediamine, N,N,N,N-tetrakis(2-hydroxyethyl)ethylenediamine, glycine, 2-amino-ethyl-phosphonic acid, salicylic acid, salicylhydroxamic acid, catechol, 1,2-dihydroxybenzene-4-sulfonic acid, acetylacetone, acetylacetonate, dimethylglyoxime and 1,3-diamino-propane. The complexing agent can be in at least one of his acidic or basic forms when complexed with copper.

In a particular embodiment, the complexing agent is ethylenediamine.

In another particular embodiment, the complexing agent is tartrate ion.

The electrolyte of the invention may advantageously be devoid of polymeric suppressors such as polyethylene glycols. In the prior art, a source of chlorine ions is generally added to the electrolyte to act in synergy with a polymeric suppressor. In the context of the present invention, it was discovered that it is not necessary to add chlorine ions to guarantee the efficacy of the solution. Moreover, the electrolyte of the invention comprises less than 50 ppm of chlorine ions. The electrolyte of the invention is preferably free from chlorine ions.

Surfactants are generally required in the prior art for improving the wettability of the surface of a barrier material to be coated with copper. According to the invention, it is not necessary to incorporate surfactants in the electrolyte.

The electrolyte may comprise a leveller, an accelerator and/or a brightener known from the prior art.

The pH of the electrolyte is preferably selected to be above 8.5. This is all the more surprising as the electrolytes of the prior art used for filling cavities generally have a far lower pH to guarantee sufficient conductivity of the solution owing to the presence of H^+ ions, and in consequence, to obtain adequate kinetics. The pH of the electrolyte of the invention is preferably between 9.0 and 9.5, and even more preferably 9.2 ± 10%.

According to a particular embodiment, the concentration of the copper (II) ions is between 0.4 and 50 mM, for example between 0.4 and 40 mM, the