C L A I M S

1. A method for reducing the optical reflectivity of a copper or a copper alloy circuitry by depositing thereon a metal layer of palladium or palladium alloy comprising, in this order, the steps of
   (i) providing a dielectric substrate,
   (ii) depositing copper or a copper alloy onto said dielectric substrate with the proviso that said dielectric substrate comprises a plating base when copper or a copper alloy is deposited by electroless (autocatalytic) plating or electroplating, and
   (iii) depositing a palladium or palladium alloy layer onto said copper or copper alloy by immersion-type plating and thereby reducing the optical reflectivity of said copper or copper alloy
   and wherein the copper or copper alloy deposited in step (ii) is structured to form a circuitry either before step (iii) or after step (iii),
   and wherein the palladium or palladium alloy is deposited in step (iii) from an aqueous plating bath comprising a source for palladium ions, an acid and at least one phosphonate compound.

2. The method according to claim 1 wherein the copper or copper alloy deposited in step (ii) is structured to form a circuitry before step (iii).

3. The method according to claim 1 wherein the copper or copper alloy deposited in step (ii) is structured to form a circuitry after step (iii).

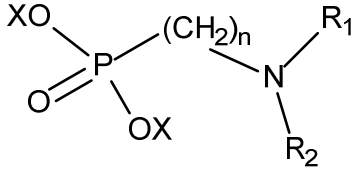
4. The method according to any of the foregoing claims wherein the palladium or palladium alloy layer formed in step (iii) is the outermost metal layer.

5. The method according to any of the foregoing claims wherein the dielectric substrate is selected from the group consisting of glass materials and plastic materials.

6. The method according to any of the foregoing claims wherein the copper or copper alloy is deposited by electroless (autocatalytic) plating from a plating bath comprising a source for copper ions, a reducing agent, at least one complexing agent and at least one stabilizer additive.

7. The method according to any of the foregoing claims wherein the plating base comprises a catalytically active metal which initiates electroless (autocatalytic) plating of copper or a copper alloy thereon or an electrically conductive material which initiates electroplating of copper or a copper alloy thereon.

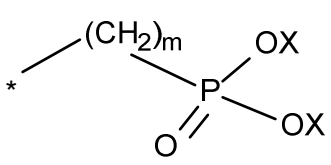
8. The method according to any of the foregoing claims wherein the at least one phosphonate compound is selected from the group comprising compounds according to formula (1)



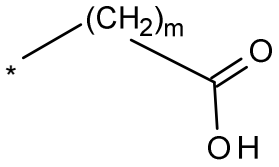
(1)

wherein

R1 is selected from the group consisting of

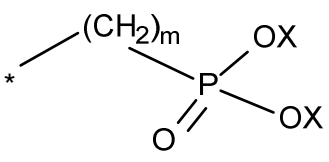


(2a),

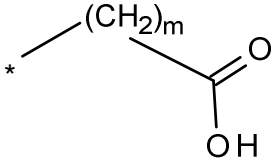


(2b), hydrogen, methyl, ethyl, propyl and butyl;

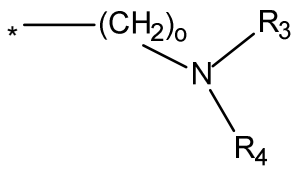
R2 is selected from the group consisting of



(2a),

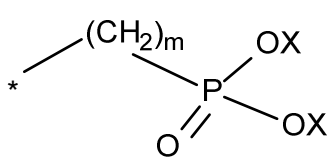


(2b),

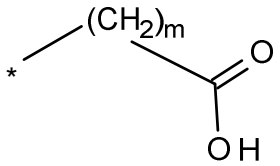


(2c), hydrogen, methyl, ethyl, propyl and butyl;

R3 is selected from the group consisting of

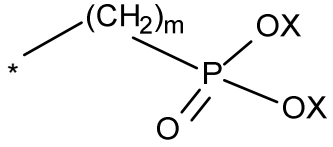


(2a),

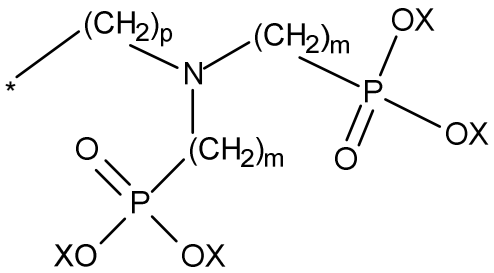


(2b), hydrogen, methyl, ethyl, propyl and butyl;

R4 is selected from the group consisting of



(2a),



(2d), hydrogen, methyl, ethyl, propyl and butyl;

n is an integer and ranges from 1 to 6; m is an integer and ranges from 1 to 6; o is an integer and ranges from 1 to 6; p is an integer and ranges from 1 to 6 and

X is selected from the group consisting of hydrogen, lithium, sodium, potassium and ammonium.

9. The method according to claims 1 and 8 wherein the concentration of the at least one phosphonate compound ranges from 0.15 to 20 mmol/l.

10. The method according to any of the foregoing claims wherein the pH value of the plating bath used in step (iii) ranges from 0.5 to 4.0.

11. The method according to any of the foregoing claims wherein the palladium alloy deposited in step (iii) is a palladium-copper alloy.

12. An immersion-type palladium or palladium alloy layer deposited on copper or copper alloy circuitry by a method comprising, in this order, the steps of

(i) providing a dielectric substrate,

(ii) depositing copper or a copper alloy onto said dielectric substrate with the proviso that said dielectric substrate comprises a plating base when copper or a copper alloy is deposited by electroless (autocatalytic) plating or electroplating, and

(iii) depositing a palladium or palladium alloy layer onto said copper or copper alloy by immersion-type plating and thereby reducing the optical reflectivity of said copper or copper alloy wherein the copper or copper alloy deposited in step (ii) is structured to form a circuitry either before step (iii) or after step (iii),

and wherein the palladium or palladium alloy is deposited in step (iii) from an aqueous plating bath comprising a source for palladium ions, an acid and at least one phosphonate compound, when used to reduce the optical reflectivity of a copper or copper alloy circuitry.

13. The layer according to claim 12 wherein the optical reflectivity is reduced by 30 to 80% of the initial optical reflectivity of a copper or copper alloy circuitry.

14. A touch screen device incorporating copper or copper alloy circuitry having an immersion-type plating of a palladium or palladium alloy layer deposited onto said copper or copper alloy circuitry, the layer being such, that it is able to reduce the optical reflectivity of the copper or copper alloy circuitry and having a lightness L* in the range of 10 to 40 as defined by the Commission Internationale de l'Eclairage L*a*b* colour space system.