Claims

1. A composition comprising at least one source of metal ions and at least one additive obtainable by reacting

a) a polyhydric alcohol condensate compound derived from at least one polyalcohol of formula (I)

$$X(OH)_m \qquad (I)$$

by condensation

with

b) at least one alkylene oxide

to form a polyhydric alcohol condensate comprising polyoxyalkylene side chains,

wherein

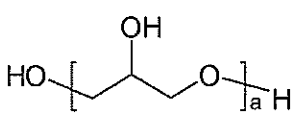
m is an integer from 3 to 6 and X is an m-valent linear or branched aliphatic or cycloaliphatic radical having from 2 to 10 carbon atoms, which may be substituted or unsubstituted.

2. The composition according to claim 1, wherein the metal ions comprise copper ions.

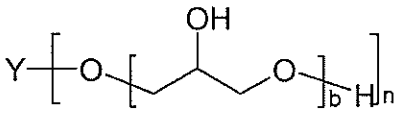
3. The composition according to anyone of the preceding claims, wherein the polyalcohol condensate is a homocondensate of a polyalcohol or a co-condensate of two or more polyalcohols, said polyalcohol condensate comprising from 2 to 50 polyalcohol units.

4. The composition according to anyone of the preceding claims, wherein the polyalcohol condensate is selected from glycerol condensates and pentaerythritol condensates and mixtures thereof.

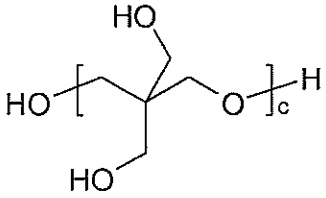
5. The composition according to anyone of the preceding claims, wherein the polyalcohol condensate is selected from compounds of formulae



(IIa)



(IIb)



(IIc)

wherein

Y is an n-valent linear or branched aliphatic or cycloaliphatic radical having from 1 to 10 carbon atoms, which may be substituted or unsubstituted,
a is an integer from 2 to 50
b may be the same or different for each polymer arm n and is an integer from 1 to 30.
c is an integer from 2 to 3
n is an integer from 1 to 6

6. The composition according to anyone of the preceding claims, wherein the alkylene oxide is selected from ethylene oxide, propylene oxide and butylene oxide or mixtures thereof.

7. The composition according to anyone of the preceding claims, wherein the polyoxyalkylene side chains are copolymers of ethylene oxide with propylene oxide and/or butylene oxide.

8. The composition according to claim 7, wherein the content of ethylene oxide in the copolymer of ethylene oxide and the further C3 to C4 alkylene oxide is from 10 to 50 % by weight.

9. The composition according to claim 7 or 8, wherein polyoxyalkylene side chains are random copolymers of at least two alkylene oxides.

10. The composition according to anyone of the preceding claims, wherein the molecular weight M_w of the additive is from 3000 to 10000 g/mol.

11. The composition according to anyone of the preceding claims, further comprising one or more accelerating agents.

12. The composition according to anyone of the preceding claims, further comprising one or more leveling agents.

13. Use of a metal plating bath comprising a composition according to anyone of claims 1 to 12 for depositing the metal on substrates comprising features having an aperture size of 30 nanometers or less.

14. A process for depositing a metal layer on a substrate by
a) contacting a metal plating bath comprising a composition according to any of claims 1 to 12 with the substrate, and
b) applying a current density to the substrate for a time sufficient to deposit a metal layer onto the substrate.

15. The process according to claim 14, wherein the substrate comprises submicrometer sized features and the deposition is performed to fill the micrometer and/or submicrometer sized features.

16. The process according to claim 15, wherein the submicrometer-sized features have an aperture size from 1 to 30 nm and/or an aspect ratio of 4 or more.

Claims

1. An invention not claimed in any divisional applications.