CLAIMS:

1. A method of producing a solution of polymer-coated metal nanoparticles, the method comprising:
   a) mixing a first aqueous alkaline solution with an aqueous polymer solution to form an aqueous alkaline polymer solution; and
   b) mixing the aqueous alkaline polymer solution with an aqueous solution of a metal salt to form a solution of polymer-coated metal nanoparticles.

2. The method according to claim 1, wherein the first aqueous alkali solution comprises a Group I hydroxide, a Group I carbonate, a Group I bicarbonate, a tetraalkylammonium hydroxide, or mixtures thereof; preferably wherein the first aqueous solution comprises sodium hydroxide and sodium carbonate.

3. The method according to any one of the preceding claims, wherein the metal salt comprises a metal selected from the group consisting of: silver, copper, zinc, selenium, gold, cobalt, nickel, zirconium, molybdenum, gallium, iron, or any combination thereof; preferably wherein the metal is silver, and/or wherein the metal salt is a nitrate, an acetate, a carbonate, a bicarbonate, a sulphate, or mixtures thereof; preferably wherein the metal salt is a nitrate.

4. The method according to any one of the preceding claims, wherein the polymer is chosen from a group consisting of: a polyamide, polyimide, polyethyleneimine, polyvinylalcohol, pectin, albumin, gelatin, carrageenan, gum, cellulose or a derivative thereof, poly (N-vinylpyrrolidone), poly (N-vinylcaprolactam), and mixtures thereof; preferably wherein the polymer is poly (N-vinylpyrrolidone), and/or wherein the polymer has a weight average molecular weight (M_w) of 20 to 80 kg/mol, optionally wherein the polymer is poly (N-vinylpyrrolidone) and wherein the polymer has a weight average molecular weight (M_w) of 30 to 40kg/mol.

5. The method according to any one of the preceding claims, wherein the solution of polymer-coated metal nanoparticles is obtainable in the absence of any additional reducing agent.

6. The method according to any one of the preceding claims, wherein in step (b), the mixing is carried out at a temperature of from 20 to 120ºC, preferably from 60 to 100ºC.

7. A solution of polymer-coated metal nanoparticles obtainable by the method of any one of the preceding claims, optionally wherein the metal nanoparticles have an average diameter of from 2 to 50nm, preferably from 3 to 12nm, optionally wherein the metal nanoparticles have a polymer coating with an average thickness of from 40 to 100 nm.

8. A method of producing cellulose fibres impregnated with metal nanoparticles, the method comprising:

(i) swelling cellulose fibres in a second aqueous alkaline solution to form swollen cellulose fibres;

(ii) removing the swollen cellulose fibres from the second aqueous alkaline solution;

(iii) mixing the swollen cellulose fibres with a solution of polymer-coated metal nanoparticles so as to impregnate the fibres with the metal nanoparticles;

(iv) separating the impregnated cellulose fibres from the solution of polymer-coated metal nanoparticles;

(v) optionally washing the impregnated cellulose fibres; and

(vi) optionally, drying the impregnated cellulose fibres,

wherein the solution of polymer-coated metal nanoparticles is obtainable by the method of any one of claims 1 to 6 or is according to claim 7.

9. The method according to claim 8, comprising preparing the solution of polymer-coated metal nanoparticles according to the method of any one of claims 1 to 6.

10. The method according to any one of claims 8 to 9, wherein the impregnated cellulose fibres are dried in step (vi), optionally wherein prior to step (v), mixing the impregnated cellulose fibres with the solution of polymer-coated metal nanoparticles so as to impregnate the fibres with the polymer-coated metal nanoparticles; and separating the impregnated cellulose fibres from the solution of polymer-coated metal nanoparticles.

11. The method according to any one of claims 8 to 10, wherein in step (iii), the solution of polymer-coated metal nanoparticles is kept at a temperature of from 10 to 30ºC, preferably 15 to 25ºC, and/or wherein the second aqueous alkaline solution comprises a Group I hydroxide, a Group I carbonate, a Group I bicarbonate, a tetraalkylammonium hydroxide, or mixtures thereof, and/or wherein step (i) comprises incubating the cellulose fibres in the second alkaline solution at a temperature of from 20 to 120ºC, preferably 60 to 100ºC, and/or wherein step (ii) comprises washing the swollen cellulose fibres after their removal from the second aqueous alkaline solution, and/or wherein the metal nanoparticles are located on both external fibre surfaces and inner fibre pore surfaces.

12. The method according to any one of claims 8 to 11, wherein the impregnated cellulose fibres have a pH of less than 7, and/or wherein the metal yield in the cellulose fibres is from 10 to 25%.

13. Cellulose fibres impregnated with metal nanoparticles obtainable by the method of any one of claims, optionally impregnated with metal nanoparticles at a metal content of at least 1.5% w/w (based on the weight of the metal and the total weight of the cellulose fibres impregnated with metal nanoparticles), preferably, at least 6% w/w (based on the weight of the metal and the total weight of the cellulose fibres impregnated with metal nanoparticles), optionally wherein the average diameter of the metal nanoparticles is from 2 to 50nm, preferably from 10 to 25nm.

14. An absorbent material comprising a blend of cellulose fibres impregnated with metal nanoparticles according to claim 13, with at least one other type of fibre, optionally wherein the at least one other type of fibre is:

a gelling fibre based on alginate, cellulose and modified cellulose, modified chitosan, guar gum, carrageenan, pectin, starch, polyacrylates or copolymers thereof, polyethyleneoxides or polyacrylamides, or mixtures thereof; and/or

a non-gelling fibre based on polyester, polyethylene, polyamide, cellulose, thermoplastic bicomponent fibres, glass fibres, or mixtures thereof, optionally wherein the at least one other type of fibre comprises carboxymethyl cellulose (CMC) and lyocell, and/or comprising from 0.1 to 10% w/w of metal

(based on the total weight of the blended fibres), and preferably from 0.5 to 5% w/w of metal (based on the total weight of the blended fibres).

15. An absorbent article comprising the absorbent material of claim 14, optionally wherein the absorbent article is a wound care dressing.