CLAIMS

The following is claimed:

1. A method of delivering storage stable hypohalide salts, the method comprising steps of:

contacting a material with a first aqueous solution including polyethylene glycol epoxide and melamine;

drying the first aqueous solution on the material;

contacting the material with a second aqueous solution including a hypohalide salt; and

drying the second aqueous solution on the material;

wherein the hypohalide salts in the material are stable for at least three months when exposed to atmosphere.

2. The method of claim 1, wherein the resulting material retains, after about 3 months of atmospheric contact, at least about 90 percent of the hypohalide salt originally retained by the material.

3. The method of claim 1, wherein the material comprises a fabric.

4. The method of claim 1, wherein the material comprises cotton, bamboo, cellulosic materials or a blend of cellulosic and synthetic fibers.

5. The method of claim 1, wherein contacting the material with the first aqueous solution comprises dipping the material into the first aqueous solution or spraying the material with the first aqueous solution.

6. The method of claim 1, wherein the hypohalide salts in the second aqueous solution comprise at least one of hypochlorite salts and hypobromide salts.

7. The method of claim 1, wherein the second aqueous solution further comprises a water-based resin or adhesive.

8. The method of claim 1, wherein contacting the material with the second aqueous solution comprises dipping the material into the second aqueous solution or spraying the material with the second aqueous solution.

9. A method of delivering storage stable hypohalide salts, the method comprising steps of:

contacting a plurality of materials including pre-formed spaces with an aqueous solution including hypohalide salt and polyethylene glycol to form hypohalide salt containing materials with pre-formed spaces;

adding the hypohalide salt containing materials with pre-formed spaces into a solution of a film forming polymer and a solvent to form a film-forming mixture; and

evaporating the solvent from the film-forming mixture to form a film containing the hypohalide salt containing materials;

wherein the hypohalide salts in the film are stable for at least about three months when exposed to atmosphere.

10. The method of claim 9, wherein the materials containing pre-formed spaces are selected from hollow fibers, foams, encapsulates, hollow or porous inorganic or polymeric beads, zeolites, and combinations thereof.

11. The method of claim 9, wherein the aqueous solution comprises about 0.01 to about 30 weight percent hypohalide salts.

12. The method of claim 9, wherein the solution of film forming polymer and solvent comprises about 0.01 to about 40 weight prevent of the film forming polymer and a balance of solvent.

13. An antimicrobial material comprising:

a first coating formed on the material by contacting the material with an aqueous solution of polyethylene glycol epoxide and melamine; and

a second coating comprising a hypohalide formed on the first coating;

wherein the hypohalide is stable for at least about three months.

14. The antimicrobial material of claim 13, wherein the material comprises a fabric.

15. The antimicrobial material of claim 13, wherein the material comprises cotton, cellulosic material, a cellulosic/synthetic blend, or other fabrics that include free hydroxyl amino, amide, or carboxylate functional groups.

16. The antimicrobial material of claim 13, wherein the first coating comprises about 0.1 to about 30 grams of polyethylene glycol epoxide and about 0.01 to about 10 grams melamine per each about 100 milliliters of solution.

17. The antimicrobial material of claim 13, wherein the second coating is formed by contacting the first coating with an aqueous solution of hypohalide salt.

18. The antimicrobial material of claim 13, wherein the second coating includes hypohalide salts.

19. The antimicrobial material of claim 18, wherein the hypohalide salt comprises one or more of sodium hypochlorite, calcium hypochlorite, sodium hypobromide, calcium hypobromide and combinations thereof.

Claims:

1. A method of delivering storage stable hypohalide salts, the method comprising steps of:

contacting a material with a first aqueous solution including polyethylene glycol epoxide and melamine;

drying the first aqueous solution on the material;

contacting the material with a second aqueous solution including a hypohalide salt; and

drying the second aqueous solution on the material;

wherein the hypohalide salts in the material are stable for at least three months when exposed to atmosphere.

2. The method of claim 1, wherein the resulting material retains, after about 3 months of atmospheric contact, at least about 90 percent of the hypohalide salt originally retained by the material.

3. The method of claim 1, wherein the material comprises a fabric.

4. The method of claim 1, wherein the material comprises cotton, bamboo, cellulosic materials or a blend of cellulosic and synthetic fibers.

5. The method of claim 1, wherein contacting the material with the first aqueous solution comprises dipping the material into the first aqueous solution or spraying the material with the first aqueous solution.

6. The method of claim 1, wherein the hypohalide salts in the second aqueous solution comprise at least one of hypochlorite salts and hypobromide salts.

7. The method of claim 1, wherein the second aqueous solution further comprises a water-based resin or adhesive.

8. The method of claim 1, wherein contacting the material with the second aqueous solution comprises dipping the material into the second aqueous solution or spraying the material with the second aqueous solution.

9. An antimicrobial material comprising:

a first coating formed on the material by contacting the material with an aqueous solution of polyethylene glycol epoxide and melamine; and

a second coating comprising a hypohalide formed on the first coating;

wherein the hypohalide is stable for at least about three months.

10. The antimicrobial material of claim 9, wherein the material comprises a fabric.

11. The antimicrobial material of claim 9 or claim 10, wherein the material comprises cotton, cellulosic material, a cellulosic/synthetic blend, or other fabrics that include free hydroxyl amino, amide, or carboxylate functional groups.

12. The antimicrobial material of any one of claims 9 to 11, wherein the first coating comprises about 0.1 to about 30 grams of polyethylene glycol epoxide and about 0.01 to about 10 grams melamine per each about 100 milliliters of solution.

13. The antimicrobial material of any one of claims 9 to 12, wherein the second coating is formed by contacting the first coating with an aqueous solution of hypohalide salt.

14. The antimicrobial material of any one of claims 9 to 13, wherein the second coating includes hypohalide salts.

15. The antimicrobial material of claim 14, wherein the hypohalide salt comprises one or more of sodium hypochlorite, calcium hypochlorite, sodium hypobromide, calcium hypobromide and combinations thereof.