Claims

1. A chitosan derivative characterized in that chitosan is modified with glutathione with the formation of a peptide bond, to form chitathion.

2. A cosmetic or pharmaceutical composition containing a chitosan derivative chitathion of claim 1 with pharmaceutically acceptable excipients.

3. The composition of claim 2, for use in preventing symptoms of allergy caused by heavy metals, preferably palladium, cobalt, chromium, gold and nickel.

4. The composition of claim 3, for use in preventing symptoms of allergy caused by the contact of skin with nickel.

5. A method for synthesis of insoluble chitosan derivative, characterized in that the formation of a peptide bond between an amine or carboxyl group of a unit in the chitosan, and one of the available carboxyl or amine groups of the molecule being attached is carried in the field of microwaves, to form the peptide bond between the amine groups of units of poly(2-deoxy-2-aminoglucose) and the modifier molecules.

6. The method of claim 5, comprising:

a) reacting a glutathione with fluorenylmethoxycarbonyl-Cl (Fmoc-Cl) in a suitable solvent, preferably dioxane;

b) reacting the fluorenylmethoxycarbonyl-glutathione (Fmoc-glutathione) with the biopolymer in the presence of 2-(1H-benzotriazol-1-yl)-1,1,3,3-tetramethyluronium hexafluorophosphate (HBTU), hydroxybenzotriazole (HOBt) and N,N-diisopropylethylamine (DIPEA);

c) deprotecting glutathione by removal of fluorenylmethoxycarbonyl protecting group and

d) suspending chitosan with the attached molecule in distilled water and lyophilizing thereof.

7. The method of claim 5 or 6, comprising:

a) processing the chitosan with microwaves in a suitable solvent,

b) adding the activators to activate the function group of the biopolymer, wherein said activators are preferably 2-(1H-benzotriazol-1-yl)-1,1,3,3-tetramethyluronium hexafluorophosphate (HBTU), hydroxybenzotriazole (HOBt) and N,N-diisopropylethylamine (DIPEA),

c) adding the unprotected capable of glutathione, and

d) processing the reaction mixture with microwaves,

e) washing the obtained modified chitosan and lyophilizing thereof.

8. The method of any of claims 5-7, wherein the formation of peptide bonds is carried out solely with the microwaves and no activators are used.

9. The method of any of claims 5-8, wherein the microwave processing is continued for 1-30 minutes.

10. The chitosan derivative of claim 1 for use for preparing a cosmetic or pharmaceutical composition for preventing symptoms of allergy caused by heavy metals.

11. The chitosan derivative of claim 10, for use for preparing a cosmetic or pharmaceutical composition for preventing symptoms of allergy caused by palladium, cobalt, chromium, gold and nickel.

12. The chitosan derivative of claim 11, for use for preparing a cosmetic or pharmaceutical composition for preventing symptoms of skin allergy caused by the contact with nickel.

13. Use of the chitosan derivative according to claim 1 for industrial and municipal waste, especially nickel removing.