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(54) Title: OPTICAL WAVEGUIDE SENSOR FOR DETECTING HEAVY METAL IONS AND METHOD OF FABRICATING THE SAME

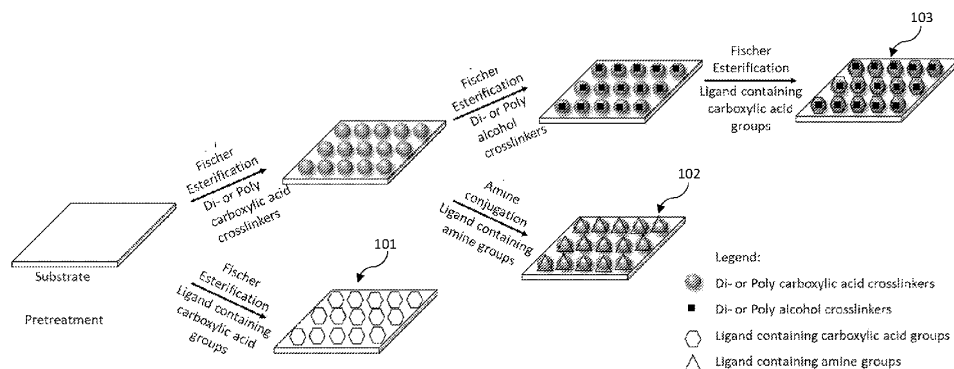


FIGURE 1

(57) Abstract: The present invention relates to a waveguide optical sensor for detecting heavy metal ions in an aqueous solution and a method for fabricating the waveguide sensor. The optical waveguide sensor comprises a substrate surface having a uniform thin layer of ligand coupled thereto with a tin catalyst for forming a functionalized substrate surface, wherein the optical waveguide sensor is configured to be interactable with a light wave at an input of the optical waveguide sensor and an aqueous solution in contact with functionalized substrate surface for determining concentration of heavy metal ions in the aqueous solution, whereby the heavy metal ions in the aqueous solution forms a coordination complex upon contact with a plurality of binding sites available on the functionalized substrate surface, consequently changing the material optical refractive index of the functionalized substrate surface which change corresponds to the concentration of the heavy metal ions. The method comprises the steps of treating a substrate surface for enabling coupling of the treated surface with a ligand; coupling the treated substrate surface with the ligand for forming a uniform thin layer of ligand on the substrate surface thereby forming a functionalized substrate surface; and cleaning the functionalized substrate surface with diluted nitric acid, wherein the coupling of the treated substrate surface with the ligand is performed with a tin catalyst, and the selection of ligand varies depending on the type of substrate surface and the types of heavy metal ions to be detected.

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