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BIOGRAPHY



Mr. Stephan Thierry Dubas

Born in Marseille, France on august 21st 1973

EDUCATION

- 1996 Master in Science, Fluid Mechanics, University of Provence, Marseille, France.
- 1998 Master in Engineering, Material science, Mines School of Ales, France.

EXPERIENCE

- 1997 Project Engineer and Consultant for "IDETEC engineering", France
- 1998 – 2004 Research associate in the department of chemistry and biochemistry at Florida State
- 2001-2004 R&D manager for Nanostrata Inc. Florida, USA.

CURRENT POSITION

- 2004-present Researcher in the polymer division of the Metallurgy and material science research institute (MMRI) Chulalongkorn University with a focus on nanomaterials.

SELECTED PUBLICATIONS

- Dubas ST, Pimpan V, Green Synthesis of Silver nanoparticles for Ammonia Sensing, TALANTA, (in press, 2008)
- Dubas ST, Iamsamai C, Potiyaraj P Optical alcohol sensor based on dye-Chitosan polyelectrolyte multilayers SENSORS AND ACTUATORS B-CHEMICAL 113 (1): 370-375 JAN 17 2006
- Dubas ST, Farhat TR, Schlenoff JB Multiple membranes from "true" polyelectrolyte multilayers JOURNAL OF THE AMERICAN CHEMICAL SOCIETY 123 (22): 5368-5369 JUN 6 2001

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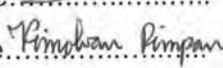
KEY WORD: SILVER / NANOPARTICLES / LAYER-BY-LAYER / SENSORS / FILMS

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Silver nanoparticles were prepared by the reduction of silver nitrate with sodium borohydride in the presence of a polyelectrolyte acting as a capping agent. Different polyelectrolytes were used including poly(methacrylic acid, sodium salt), poly(acrylic acid, sodium salt), poly(4-styrene sulfonic acid-co-maleic acid, sodium salt), sodium alginate and humic acid. Their concentrations were varied from 0.1, 0.5, 1, 5 and 10 mM. All prepared solutions exhibited a strong plasmon band at the wavelength of 400 nm confirming the formation of silver nanoparticles. Layer-by-layer technique was used to deposit silver nanoparticles into thin films. The growth of these films was affected by the dipping time, the dilution and the ionic strength of the solution. Nanoindentation measurements revealed that the film hardness decreased when lower concentrations of capping agents were used in the preparation of the silver nanoparticles.

Sensing properties of silver nanoparticles were then investigated in the forms of solution and thin film. It was found that only nanoparticles prepared in the presence of 0.1 mM of capping agents could be used for organic compound sensing. It was also observed that at this concentration, alginate-capped silver nanoparticle solution had the highest sensitivity to organic compounds while its thin film displayed a strong color shift from yellow in water to red in methanol and ethanol. The best detection was achieved when the ratio of alginate:silver nitrate was 0.1:1. In the case of herbicide sensing, it was found that the color of humic acid-capped silver nanoparticle solution changed from yellow to orange red and purple with increasing herbicide concentration. Furthermore, an improvement of the sensing sensitivity of the film could be done by the modification of film surface with a layer of polycationic polymer.

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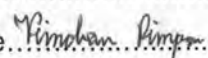
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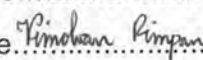
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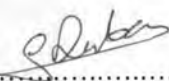
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