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with numerous shopping possibilities. Nearly all shops of them are open from 9.30 to 20.00.

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Synthesis of Stable Silver Nanoparticles Using Aqueous Solutions of Pullulan and its Polyaldehydes

Tools for Metallomics 1

The Application of Microwave Digestion for Improved Efficacy of Metalloprotein Identification
Afton, S., Research Triangle Park/USA, Van Sant, C., Research Triangle Park/USA, Cargile, B. J., Research Triangle Park/USA, Burger, M. K., Research Triangle Park/USA, Essader, A. S., Research Triangle Park/USA, Levine, K. E., Research Triangle Park/USA, Grohse, P. M., Research Triangle Park/USA

Electrospray Ionization Mass Spectrometry (ESI-MS) of Benzoylthioure (BTU) Complexes of Palladium and Platinum
Aggarwal, S. K., Mumbai/IND, Kumar, P., Mumbai/IND, Jaison, P. G., Mumbai/IND, Telmore, V. M., Mumbai/IND

Identification and Quantification of Selenoproteins in Human Serum and Plasma Standard Reference Materials
Ballhaut, G., Charleston/USA, Davis, W. C., Charleston/USA, Kilpatrick, L. E., Gaithersburg/USA

Speciation of Biologically Important Metal Chelate Systems Using Hyphenated Techniques: CE-MS Study of the Distribution of Ni (II)-Histidine in Solution
Barrett, U. M., Cork/IRL, Crean, C., Cork/IRL, Glennon, J. D., Cork/IRL

ToF-SIMS and Laser-SNMS Analysis of Macrophages after Uptake of Silver Nanoparticles

Monitoring the Synthesis of Metal Glycinates by LC-ESI-MS
Ferreira, O., Budapest/H, Németh, A., Budapest/H, Demnovics, M., Budapest/H

Exploration of Target Molecules for Molecular Imaging of Ulcerative Colitis

Micro-XRF Imaging and X-ray Absorption Fine Structure Analysis Utilizing High-energy Synchrotron Radiation to Investigate the Accumulation Mechanism of Cd in Plants
Synthesis of stable silver nanoparticles using aqueous solutions of pullulan and its polyaldehydes


Pullulan is one of the extracellular polysaccharides produced by the "black yeast" Aureobasidium pullulans that is widely spread in different ecological sites, including forest, soil and peat [1]. Pullulan is a linear α-D-glucan which structure consists of a series of maltotriose units connected by α-D-(1→6) glycosidic bonds. However, some of the maltotriosyl residues are replaced by higher oligosaccharide units, most frequently with maltotetraosyl units [2]. In the earlier work we reported structure of the pullulan produced by Aureobasidium pullulans, strain CH-1 [3].

Silver nanoparticles have been synthesized by using linear polysaccharide pullulan and its polyaldehyde that served to cross-link the individual polymeric chains of this polysaccharide. Obtained solutions of polymers were used as both the reducing and stabilizing agents. Reactions were carried out in two different conditions: in the microwave and in the autoclave. Nanoparticles thus prepared are found to be stable in aqueous solution over a period of one month at room temperature, without any aggregation of the particles. UV-Vis spectra of the investigated solutions showed a characteristic absorption peak at 424 nm.

The morphology of the samples was analyzed using scanning electron microscopy (SEM), which showed polydispersity of the particle size.

Antimicrobial activity testing was carried out at agar plates with different concentrations of the investigated solutions, against various strains of bacteria and fungi. Results showed that the microbial growth was gradually reduced as the concentration of the silver increased.

Application of pullulan and its derivatives in nanochemistry extends the application of this polysaccharide, which is already widely present in various fields, such as medicine, biotechnology, food, pharmaceutical, cosmetic and many other industries [4].

References:
SYNTHESIS OF STABLE SILVER NANOPARTICLES USING AQUEOUS SOLUTIONS OF PULLULAN AND ITS POLYALDEHYDES


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Pullulan is one of the extracellular polysaccharides produced by the “black yeast” Aureobasidium pullulans that is widely spread in different ecological sites, including forest, soil and peat [1]. Pullulan is a linear α-D-glucan which structure consists of a series of maltotriose units connected by α-D-(1→6) glycosidic bonds. However, some of the maltotriosyl residues are replaced by higher oligosaccharide units, most frequently with maltotriosaol units [2]. In the earlier work we reported structure of the pullulan produced by Aureobasidium pullulans, strain CH-1 [3].

Silver nanoparticles have been synthesized using pullulan and its polyaldehydes that served to cross-link the individual polymeric chains of this polysaccharide and 100 mM AgNO₃. Obtained solutions of polymers were used as both the reducing and stabilizing agents. Reactions were carried out in two different conditions: in the microwave and in the autoclave. Nanoparticles thus prepared are found to be stable in aqueous solution over a period of one month at room temperature, without any aggregation of the particles (Figure 1). UV-Vis spectra of the investigated solutions showed a characteristic absorption peak at 424 nm (Figure 2).

The morphology of the samples was analyzed using scanning electron microscopy (SEM), which showed polydispersity of the particle size (Figures 3, 4).

Antimicrobial activity testing was carried out at agar plates with different concentrations of the investigated solutions, against various strains of bacteria and fungi. Results showed that the microbial growth was gradually reduced as the concentration of the silver increased. Figure 5 represents some experiments against Micrococcus lysodeikticus ATCC 4698.

Application of pullulan and its derivatives in nanochemistry extends the use of this polysaccharide, which is already widely present in various fields, such as medicine, biotechnology, food, pharmaceutical, cosmetic and many other industries [4].

REFERENCES:

ACKNOWLEDGEMENT: This work was supported by the Ministry of Science and Technological Development, Republic of Serbia, Project No. III 43004.