

## Sumita Swar - Evaluation of supervisor.

Sumita Swar has submitted her PhD. Dissertation on active surfaces prepared by extensive use of chemical modification of synthetic polymers. The Dissertation is divided into four parts. The first one is dealing with novel approach to anti-corrosive wet chemical surface modification of PET by insertion of alkyl and hydroxyl groups. It was achieved by using different Grignard reagents and confirmed by several different characterization techniques. High antibacterial efficiency against four different types of biofilm active, pathogenic bacterial strains namely: *Staphylococcus aureus*, *Escherichia coli*, methicillin-resistant *Staphylococcus aureus* (MRSA) and *Pseudomonas aeruginosa* has been found. In the second part the modifications of polyamide surfaces were examined. It was based on an efficient reduction of amide functional groups to secondary amine on Nylon 6 film surface with borane-tetrahydrofuran ( $\text{BH}_3\text{-THF}$ ) complex, followed by N-alkylation. The grafted Nylon 6 samples were further modified by physical assemblage of copper nanoparticles (Cu NPs) on the surface. Again, the pathogenic bacterial strains: Gram positive *Staphylococcus aureus* and Gram negative *Pseudomonas aeruginosa* were used to depict the antibacterial efficacy. In the third part, the interest was focused to the syntheses of the copper nanoparticles (Cu NPs) for the deposition on grafted Nylon 6 surface to examine the possibility of Cu NP physisorption on surface as well as to evaluate the antibacterial efficacy of prepared Cu NP deposited Nylon 6 samples. In the last part, the syntheses of mesoporous silica nanoparticles (MSNs) that are widely studied for drug delivery. The resulting mesoporous surfaces are now conveniently prepared making use of recently published collection of carefully verified synthetic procedures. The selected MSNs with various pore diameters and morphologies were examined to evaluate their capability of L-DOPA drug loading and releasing. It is extremely important drug for Parkinson's disease.

All the above mentioned tasks are methodically very difficult. It usually starts with organic synthesis applied to surface chemical modification. Especially the chemistry of organometallics is far from being considered as easy task. The syntheses have been followed by structural analyses using all methods available and finally, evaluation of biological activity should follow for assessment of biological activities. Sumita has tried very hard to master all these subjects. I should mention and acknowledge the help and deep practical guidance given by Veronika Zajícová.

Finally, I have to say, that I consider the Dissertation in question as very good.

I. Stibor

Prof. Ing. Ivan Stibor, CSc.

supervisor