

# **Seminář odd. 26**

## **Tenkých vrstev a nanostruktur**

*Fyzikální ústav AVČR, Cukrovarnická 10, Praha 6*

*datum: 16. 7. 2013 úterý*

*čas: 10:00*

*mítnost: knihovna, budova A, 1.p.*

### **TÉMA**

**Hybrid (Organic/Inorganic semiconductors) absorbing layer for solar cell applications**

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Solar cells based on soluble conjugated polymers are of interest because they offer several advantages over inorganic semiconducting materials. Conjugated polymers can exhibit modulation in their electronic properties by molecular engineering, making cell processing easy leading to a low manufacturing cost. But compared to inorganic semiconductors, polymeric devices have low carrier mobilities and optical absorption, which cause an inefficient charge generation and transport. This problem can be overcome by mixing inorganic nanoparticles with the polymer and the use of such hybrid material has the potential of bridging the efficiency gap that exists between organic and inorganic semiconductor materials. The choice of nanoparticles for mixing with a conducting polymer depends on the desired application. Proper mixing of nanoparticles and polymer leads to novel properties (optical and electrical) in the hybrid (nano-composite) material. In addition, the effect of nanoparticles dispersion on conjugated polymer-inorganic nanoparticles composites has been rarely reported and the important question that is not clear is – where these nanoparticles will chemically attach to the polymer?

In my presentation, I will talk about how my research overcomes these problems. Hence, once the proper mixing of the two constituents is achieved, one expects a better interpenetrating network required for photo-generated charge carrier transport. The properties of hybrid layers made using the blend solutions will be discussed. Apart from materials research, I will also discuss my research work carried out at University of Agder which includes the photovoltaic systems under southern Norwegian conditions.

odborný garant: *RNDr. Bohuslav Rezek, Ph.D.*