



Univerzita Karlova v Praze, Přírodovědecká fakulta

Sekce chemie PřF UK v Praze
zve všechny zájemce na přednášku z cyklu

Quo Vadis Chemie

Zeolite-templated 3-D graphene-like microporous carbons



kterou přednese

Prof. Ryong Ryoo

¹Center for Nanomaterials and Chemical Reactions,
Institute for Basic Science, Daejeon 305-701, Republic of
Korea

²Department of Chemistry, KAIST, Daejeon 305-701,
Republic of Korea

dne 23.05. v 14:00 hod.

**v posluchárně CH2, v budově chemických kateder PřF UK
Hlavova 8, Praha 2**

Abstract: Thermal carbonization of organic substances within porous inorganic template has been well known for many years as a synthetic route to nanoporous carbons. When the templating approach is applied to mesoporous templates, the template pores can be perfectly replicated into carbon frameworks. After removal of the templates, the template-free carbons exhibit highly ordered mesoporous structures inherited from the templates. However, when the templated synthesis is applied to smaller-pore, microporous zeolite templates, the carbonization results in carbon deposition outside the template pores as well as at the internal pores. The non-selective carbon deposition is so far the chief obstacle to research activities on the zeolite-templated microporous carbons. Here, we demonstrate that graphene-like carbon frameworks can be selectively formed inside the zeolite micropores without carbon deposition at the external surfaces by incorporating carbonization transition metal catalysts into the zeolite pores. X-ray crystallographic analysis using zeolite single crystals shows that a curved graphene-like layer of carbon atoms is generated along the zeolite pore walls. Resultantly, the carbon products liberated from the zeolite templates are composed of uniform and ordered micropores with fully graphene-like frameworks. Furthermore, the synthesis can be scaled up readily, which is important for various practical applications such as absorbents, Li-ion batteries, and zeolite-like carbon catalysts.

