MRSEC SEMINAR SERIES

Chemistry of Graphene Inorganic Analogues

The chemistry of graphene is growing rapidly in last decade and broad range of graphene derivates was prepared. Nevertheless, only two stoichiometric derivates are currently known – hydrogenated and fluorinated graphene (graphane and fluorographene). Compared to graphene, these materials exhibit significantly different properties, *e.g.* higher reactivity as well as large differences in physical properties. Especially fluorographene can be applied as a substrate for nucleophilic substitution reactions, which significantly extend the possible chemical modifications of graphene. Currently, the chemistry of the other 2D materials starts to be explored. However, the chemistry of inorganic 2D materials like pnictogens and transition metal dichalcogenides is not well known and only several procedures were already reported. In comparison with graphene, new synthetic protocols have to be applied because the chemistry of these materials is extremely variable. In the case of transition metal dichalcogenides, the formation of the M-X-C bond (M is a metal, X is any chalcogenide) can be used as a starting point for exploring their chemistry and for further derivatisation. The chemistry of layered pnictogens is significantly different. In this case, various reactions including nucleophilic substitution can be applied, however, the bonding through the oxygen functionalities on pnictogen surface is observed in many cases.

Prof. Zdeněk Sofer is an Associated Professor at the University of Chemistry and Technology Prague since 2013. He received his PhD also at University of Chemistry and Technology Prague, Czech Republic, in 2008. During his PhD, he spent one year in Forschungszentrum Julich (Peter Grünberg Institute, Germany) and also one postdoctoral stay at University Duisburg-Essen, Germany. Research interests of prof. Sofer concentrate on nanomaterials graphene-based materials, and other 2D materials, its chemical modifications and electrochemistry. He is a member of Editorial board of Flatchem. He has published over 310 articles, which received over 6000 citations (h-index of 39).

Zdeněk Sofer
Dept. of Inorganic Chemistry
Univ. of Chemistry and Technology
Prague, Czech Republic

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