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THE CHEMISTRY OF GRAPHENE AND ITS INORGANIC ANALOGUES

The chemistry of graphene is growing rapidly in last decade and broad range of graphene derivatives was prepared. Nevertheless, only two stoichiometric derivatives 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

Biography

Zdenek 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 Jülich (Peter Grünberg Institute, Germany) and later, one Postdoctoral stay at University Duisburg-Essen, Germany. His research interests include nanomaterials graphene-based materials and other 2D materials, its chemical modifications, reactivity and applications in electrochemistry, separation and electronic. He is a Member of Editorial board of FlatChem. He has published over 300 articles, which received over 5000 citations (h-index of 35).

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