Letter of recommendation:

RNDr. Vladimír Ďorďovič to obtain a degree of Doctor of Philosophy in Physical Chemistry

It is my pleasure to strongly recommend Vladimir to defend the Thesis and to obtain the degree of PhD.

I know Vlado for almost 10 years. First, I was his teacher in the courses in General chemistry, later on, the supervisor of his Bachelor, Master and Doctoral thesis. During this period, he helped me to establish the Laboratory of boron cluster compounds as the part of Soft Matter research group at the Department of Physical and Macromolecular Chemistry. Our subject of interest is a physicochemical view on the solution behavior, assembly and interaction potential of boron cluster compounds, however, our work is truly multidisciplinary – it spans from physical chemistry, nanochemistry, material chemistry, analytical chemistry towards macromolecular chemistry and synthesis. During 4 years of his doctoral study, he managed to publish 5 papers (another one is under consideration for publishing) and to present actively 4 conference contributions on international conferences. Vlado has been an irreplaceable part of our effort to elucidate the behavior of this interesting issue, and his PhD research work can be taken as an excellent overview of boron cluster physical and supramolecular chemistry.

From the above mentioned, it is obvious that Vlado quickly established himself as a valuable member of our laboratory, that comprises perfect skills in physical and colloidal chemistry (scattering, spectroscopy and microscopy techniques), deep survey on up-to-date literature, and friendly attitude within the group and the Department. Moreover, he visited several prestigious laboratories in Germany (prof. Gradzielski, TUB), Poland (prof. Adamczyk-Wozniak) and Spain (prof. Teixidor and Vinas) during his study, and help me in this way to cultivate our common cooperation with these excellent research groups abroad.

His most important scientific results can be summarized as follows: (i) Anionic boron cluster compounds behave as amphiphiles in water that is reflected by their surface activity and capability to associate in water; (ii) Metallacarborane conjugates consisting of two clusters and short PEG-linker form compact nanostructures in water and exhibit strong selectivity towards alkaline cations; (iii) Metallacarborane-containing drugs can interact with biocompatible and water soluble polymers. These hybrid nanoparticles are promising candidates for controlled drug delivery vessels.

In summary, I do believe that the research work of Vladimír Ďorďovič fulfills all the required conditions to obtain the degree PhD, and represents a great achievement in the field of supramolecular and macromolecular chemistry.

In Prague, 9th June 2017

RNDr. Pavel Matějíček, Ph.D., Assistant professor, Faculty of Science of Charles University