Supervisor's statement on the dissertation of the doctoral student

M.Sc. Udit Acharya

M.Sc. Udit Acharya has joined my team after completing his master studies at Tribhuwan University in Kathmandu, Nepal, in October 2015 as a student of postgraduate UNESCO courses. In October 2016 he started his doctoral studies at the Faculty of Mathematics and Physics, Charles University, doing the experimental work for his PhD thesis in the Institute of Macromolecular Chemistry, CAS, under my supervision.

Due to his previous specialization on atmospheric phenomena and studies focused on more general physics, at the beginning he had to overcome the gap between his previous education and knowledge needed for studies of optical and electrical properties of polymers and other organic solids. Due to even more specific problems related to optoelectronic phenomena in organic materials this period was quite challenging for him. However, he succeeded well to orient himself in this problematic and soon became a very valuable member of the team.

His dissertation was focused on better understanding and improvement of the electrical conductivity of conducting polymers and it was connected to current issues addressed within several TAČR and GAČR projects solved in the department. His scientific work was mainly related to the area of flexible printed electronics using organic and hybrid materials. From an experimental point of view, the topic was quite difficult, as it required the use of special procedures that made it possible to overcome the generally low stability of organic materials and reproducibility of the experimental values. It is understandable that in a field where basic approaches and functional mechanisms have not yet been clarified, the ratio of the amount of positive results to the amount of work spent was extremely unfavorable and the path to functional samples, of which physical measurements could be made were very complex.

The topic of his dissertation was significantly interdisciplinary, the doctoral student had to master a wide range of physical and physicochemical experimental methods as well as practical procedures for the preparation of functional polymer samples. The doctoral student always approached the solution of experimental problems with great care and showed a critical approach and independence in interpreting the results. It can be stated that he has mastered the basics of scientific work and demonstrated his ability to work independently in science.

In his PhD thesis and a relatively big number of other articles he has contributed with his work he succeeded to develop several systems of conducting polymers with improved

electrical conductivity, elucidating the mechanisms of charge carrier transport and the relation between the polymer and composite nanostructure and the charge carrier mobility. He proved his ability of a careful and innovative scientific work. His results are very valuable and I recommend his PhD thesis to be accepted for defence and for obtaining PhD degree.

Prague, June 13, 2023

RNDr. Jiří Pfleger, CSc.
supervisor