

I. IDENTIFICATION DATA

Thesis title:	Optical Absorption of Colloidal Mixtures of Nanodiamonds and Metal Nanoparticles
Author's name:	Vendula Hrnčířová
Type of thesis:	bachelor
Faculty/Institute:	Faculty of Electrical Engineering (FEE)
Department:	Department of Circuit Theory
Thesis reviewer:	Markéta Šlapal Bařínková
Reviewer's department:	Department of Physics

II. EVALUATION OF INDIVIDUAL CRITERIA

Assignment <i>How demanding was the assigned project?</i>	extraordinarily challenging
I evaluate the final thesis as extraordinarily challenging, especially considering that it is a bachelor's thesis. The student had to master a number of laboratory techniques and study a large amount of literature, along with the fact that research and publications on the topic of colloidal nanoparticle mixtures are scarce. In addition, the student had to use a variety of techniques to best visualize the phenomena under investigation during data evaluation.	

Fulfilment of assignment <i>How well does the thesis fulfil the assigned task? Have the primary goals been achieved? Which assigned tasks have been incompletely covered, and which parts of the thesis are overextended? Justify your answer.</i>	fulfilled
The student fulfilled the assignment in its entirety. The dependence of optical properties on the concentration of individual colloids and colloidal mixtures of different composition was measured and analyzed. Compared to the assignment, the thesis was enriched with measurements of zeta potential, DLS and pH of individual colloids and mixtures, which complemented the knowledge obtained from spectrophotometric measurements. Under the supervision of the supervisor, the student also examined the individual samples using a scanning electron microscope. In addition to the spectrophotometric measurements themselves, preliminary experiments were necessary to determine the appropriate procedures and conditions prior to the start of the research project.	

Activity and independence when creating final thesis <i>Assess whether the student had a positive approach, whether the time limits were met, whether the conception was regularly consulted and whether the student was well prepared for the consultations. Assess the student's ability to work independently.</i>	A - excellent.
After initial training, the student performed all subsequent measurements very independently. She regularly consulted the work and was always prepared for the consultations. She actively incorporated the notes and recommendations from the consultations into her own work. The student was also very proactive and independent in writing up her final thesis, always delivering individual versions for review in advance.	

Technical level <i>Is the thesis technically sound? How well did the student employ expertise in his/her field of study? Does the student explain clearly what he/she has done?</i>	A - excellent.
The thesis is clearly written and contains relevant information necessary to understand the individual steps of the experimental work and to discuss the results.	

Formal level and language level, scope of thesis <i>Are formalisms and notations used properly? Is the thesis organized in a logical way? Is the thesis sufficiently extensive? Is the thesis well-presented? Is the language clear and understandable? Is the English satisfactory?</i>	A - excellent.
The student chose English for her thesis, which is very appropriate given the topic and the available literature. The language level of the thesis is very good. The overall structure of the thesis is clear with a logical sequence of chapters. For	

the sake of clarity, a short discussion was added to each chapter of the results to explain the logical sequence of measurements.

Selection of sources, citation correctness

A - excellent.

Does the thesis make adequate reference to earlier work on the topic? Was the selection of sources adequate? Is the student's original work clearly distinguished from earlier work in the field? Do the bibliographic citations meet the standards?

The thesis contains a sufficient amount of relevant and current literature. At the same time, the literature used is varied - it includes primary sources, review articles, as well as information from manufacturers, for specifying devices. Citations are written according to citation conventions.

Additional commentary and evaluation (optional)

Comment on the overall quality of the thesis, its novelty and its impact on the field, its strengths and weaknesses, the utility of the solution that is presented, the theoretical/formal level, the student's skillfulness, etc.

In this work, the issue of colloidal mixtures of surface modified nanodiamonds and two types of plasmonic nanoparticles was investigated in great detail. From the measured data a publication is currently being prepared for presentation at an autumn conference in Dresden (alternatively in Brno).

III. OVERALL EVALUATION, QUESTIONS FOR THE PRESENTATION AND DEFENSE OF THE THESIS, SUGGESTED GRADE

The aim of the bachelor thesis was to characterize colloidal mixtures of nanodiamonds and plasmonic nanoparticles using several complementary methods. The student was very independent and took initiative in solving the thesis. Throughout the research project, she demonstrated the ability to think of alternative approaches to problems, learn laboratory techniques quickly and be able to apply them, and analyze the relatively complex data she obtained from the measurements. All of this translated into a cohesive thesis that clearly and comprehensively summarized the findings, including possible models for interpretation. In conclusion, I would like to point out that working with the student was really very pleasant and seamless. The student has an excellent sense of scientific work and evaluation of results.

The grade that I award for the thesis is **A - excellent**.

Date: **28.5.2024**

Signature: