



Letter of Recommendation

to support international recognition of candidate for the degree professor

Name of candidate: Assoc. prof. RNDr. Adriana Zeleňáková, DrSc.

Professional relationship with candidate:

I have known Assoc. prof. Adriana Zeleňáková for a long time. I met her in many international conferences on magnetism, during which we had interesting and fruitful discussions on our common research field: nanoparticle magnetism. I was impressed by her deep knowledge on fundamental properties of magnetic nanoparticles and her research activity on the application of them.

Scientific focus of candidate:

The focus of her activity is on two complementary approaches to nanoparticle magnetism:

a) Fundamental properties of magnetic nanoparticles

She investigated a variety of phenomena exhibited by magnetic nanoparticles (e.g. superparamagnetism, relaxation processes, size and surface effects, exchange bias in core/shell systems, superspin glass freezing in strongly interacting systems) in different types of materials (e.g. nanocomposite systems, nanoparticles dispersed in matrices, nanoparticles embedded in the hollows of nanoporous matrices). The structural and magnetic properties of the above systems were investigated by advanced techniques.

b) Applications of magnetic nanoparticles

She investigated the application of a number of nanoparticle systems in biomedicine (target drug delivery, magnetic hyperthermia, cytotoxicity) and cryomagnetic refrigeration.

Quantity and quality of publications of candidate:

She published 89 high quality papers in international Journals. The number of papers published in the last 10 years has tripled compared to the previous decade. Most of them were published in high impact journals.

Citation rate of candidate

The number of citations in the last 10 years has increased almost tenfold compared to the previous decade.

Participation of candidate in international projects:

She has been very active in participating in projects. Since 1997 she has been co-investigator of a large number of domestic VEGA and APVV projects, and some projects from structural funds within ERDF EU calls. In the last 5 years she participated as a responsible researcher in 2 domestic VEGA, 2 domestic APVV projects, a project from the EU Structural Funds under the OPII call - 313011AUW7 "Nanoparticles for solving diagnostic and therapeutic problems with COVID 19 "(NANOVIR).

International recognition of candidate:

A. Zeleňáková is internationally recognized as one of the leading experts in the field of magnetic nanoparticles and their applications. This is evidenced by invited lectures at major international and domestic conferences with international participation. She has a number of scientific collaborations within the international nanoparticle magnetism community. She is a reviewer for major international journals.

Contribution of candidate:

Adriana Zeleňáková made a very important contribution in the field of nanoparticle magnetism. I would stress the originality of her contribution to the application of magnetic nanoparticles. This was due to her deep knowledge of fundamental properties and phenomena exhibited by magnetic nanoparticles, which allowed her to select suitable materials of the right composition for tuning their properties to optimize the performance for applications in medicine and cryomagnetic refrigeration.

Moreover, it is worthy of mention the awards she received, e.g. the Prize by the Ministry of Education, related to her research, and the Prize by Dean of Faculty of Sciences, UPJS, for her teaching performance. She has been very active in the organization of conferences,

Last, but not least, she is the head of Department of Condensed Matter Physics.

Recommendation:

I recommend Assoc. prof. Zeleňáková being awarded the degree Professor.

Name of international advisor (referee): Dino Fiorani

Date: 2/9/2025 _____

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