



## Supervisor assessment

**Student: Ing. Michaela Fecková**

**Dissertation: Organic and organometallic heterocyclic luminescent materials: towards OLED applications**

Ing. Michaela Fecková is working under my supervision since her early bachelor work. In general, she focuses her studies towards polarized organic  $\pi$ -conjugated materials with application across organic electronics. After finishing her diploma work, she had taken occasion to pursue doctoral studies under Czech-French joint guidance of Assoc. Prof. Sylvain Achelle and me. Hence, she spent half-and-half of the doctoral studies at the University of Rennes 1 and at the University of Pardubice.

The submitted dissertation is divided in several chapters; the first chapter clearly and comprehensively introduces luminescence phenomena and OLED technology with all related aspects. The attention is subsequently directed towards extensive literature search work on pyrimidine-based chromophores with perspective applications as fluorophores as well as 2PA and OLED materials. This part is written clearly, completed with suitable figures and schemes and exhaustive number of references is provided. Hence, I consider the whole theoretical part as comprehensive and showing current state-of-the-art in the given field. It is also noteworthy that I have proposed only minimum of alternations, which confirms that M. Fecková is well-matured in working with scientific resources. This is further corroborated by her active and significant involvement in preparation of manuscripts that were published in renowned scientific journals during her studies.

The subsequent chapters are devoted to the student's three projects carried out within the scope of her dissertation. The first one focuses on di- and tri(arylvinyl)pyrimidine chromophores. Admirable number of new pyrimidine derivatives has been prepared and fundamental structure-property relationships were elucidated. These outcomes were published in three articles in *J. Org. Chem.*, *J. Photochem. Photobiol. A*, and *PhysChemChemPhys*. The second project targets acridan-substituted pyrimidines as materials for OLEDs. These molecules were designed as 3<sup>rd</sup> generation TADF emitters and despite the TADF property has not been confirmed, valuable outcomes were obtained, such as aggregation-induced and dual emissions. These results were published in *Q1 Chem. Eur. J.* Pyrimidine platinum complexes are the last topic to which M. Fecková has been involved in. In contrast to previous two projects, pyrimidine has been employed as *N*-ligand chelating Pt metal. It turned out that these Pt-complexes possess interesting and tunable luminescent properties both in solution and solid

state. These outcomes were recently published in *Eur. J. Inorg. Chem.* In general, I highly appreciate complex nature of all achieved and published outcomes including novel syntheses and subsequent investigation of optical, X-ray, thermal, and advanced optical properties along with a DFT support.

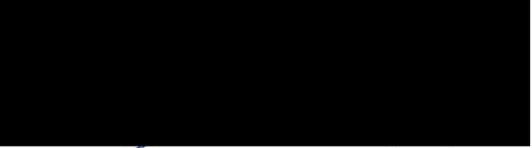
I gladly conclude that M. Fecková has evolved into an independent and matured researcher capable to work in international teams. It was my immense pleasure to see Michaela scientifically and personally growing, and despite her initial worries about the joint Czech-French supervision, she managed the doctoral studies excellently. Besides her scientific work, I also appreciate her pedagogical activity as she supervised bachelor students within my workgroup.

Based on the aforementioned statements I herewith

### RECOMMEND

the dissertation work of M. Fecková to be defended at the University of Pardubice as well as at the University of Rennes 1.

In Pardubice April 27, 2021



prof. Ing. Filip Bureš, Ph.D.

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