

Supervisor's opinion

Dissertation: Functional High Performance Colorants

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Training workplace: Institute of Organic Chemistry and Technology

Study program: Organic technology

Ing. Fouzy Alafid submitted a dissertation dealing with the preparation of new organic colorants, which, in addition to their color, also have functional properties, namely anti-corrosion and related antimicrobial properties. The basic structures of these colorants are complexes of azobarbituric acid and, in general, azo, as well as colorants that we refer to as perylenes. The work is very extensive and it is a collective work, where the author of this dissertation successfully prepared all these colorants, measured the UV/Vis spectra and pre-tested. The structure of prepared colorants was confirmed in the FChT laboratories. Corrosion properties and antimicrobial properties were measured again in FChT laboratories. In the field of antimicrobial properties, he also collaborated with the Technical University of Prague and the Tomáš Bata University in Zlín, Center for Polymer Systems. Since these new functional colorants are intended as additives to pigments, which we refer to as High Performance Pigments (HP-pigments), he also worked closely with Synthesia a.s. and COC s.r.o., Pardubice on the development of HP-pigment technologies. He was a member of the solution team of technologically very important projects:

FV30048, FV-TRIO (2016-2021), New additives for multifunctional modification of polymer surfaces. Provider: The Ministry of Industry and Trade, Czech Republic.

Contract research, SD 373009 (2017 – 2018), Laboratory investigation of high performance pigments.

Contract research, SD 30301/59/30323 (2021 – 2022), Antimicrobial colorants.

If I have to highlight the greatest contribution of this dissertation, it is the fact that it opened a new class of highly effective anti-corrosion pigments based on the Mg^{2+} cation. Of course, in addition to the fact that Synthesia a.s. can successfully produce HP-pigments PY 150, PR 179, PB 31 and in the future PR 149. He published the results of this work as a co-author in two journals marked Q2, is a co-author of 2 patents, 1 utility model, personally reported on the results of his work at 1 international conference, 3 national conferences, and is the author and co-author of 4 posters at these conferences. He thus contributes to the successful development of the chemical industry in the Czech Republic and I recommend his work for defense.

In Pardubice on February 9, 2023

Prof. Ing. Radim Hrdina, CSc.