

Review of the dissertation thesis for ing. Fouzy Alafid

The proposed dissertation thesis deals with the preparation of functional colorants, and it is divided into four parts based on the type of colorant prepared. Each chapter contains a short introduction, an experimental part with detailed preparation of different compounds, the result part, and a conclusion summarizing the obtained results. The topic and the obtained results are essential for industrial applications, as it is shown by the impressive outputs presented in the thesis in the form of three patents and one commercialization. Moreover, two publications in international journals were published based on the results of the dissertation thesis (one of them is from 2014; thus, I have to ask how long ing. Fouzy Alafid was working on his thesis?). The scope of the work is comprehensive and corresponds to the demands of the dissertation thesis.

The formal style of the work was a little bit confusing due to the following:

1. The higher number of typing errors and grammar errors (e.g., present tense after past tense in one sentence).
2. Error in the numbering of figures (almost from the beginning).
3. Non-standard numbering of chapters (e.g., chapter 4 has sub-numbering starting at 1.1, not 4.1, which I expected).

I have one question about the formal part of the work – has the student performed all the experiments described? In such a case, the number of methods starting from characterization through synthesis and ending at antimicrobial activity would impress me. However, I'm unsure about it because some experiments were performed in different workplaces. In such a case, the thesis deserves at least the acknowledgment of these workplaces.

The thesis describes the wide part of colorants properties – especially anticorrosion and antimicrobial, which are demanded in the large field of applications. It also describes three types of pigments (based on azobarbituric acid, perylene-based, and azo-based) possessing such properties. In some cases nicely describes the structural reasons of the molecules for such behavior. I must appreciate the number of tested ways leading to the desired product, especially in the second chapter. On the other side, I miss in most of the chapters the more profound discussion about the obtained results, e.g., the aim of the work promises that "the relation between their structure and the antimicrobial effect was studied," but I haven't found this study in the promised chapter. As the work is divided into the abovementioned chapters, I would like to request a summary connecting all of these chapters. This leads me to the other questions dealing with the thesis:


1. I have a question about the practical performance of one of the experiments in Chapter 1, part 1.2.1. In synthesizing PY 150 in ϵ modification, the student describes the maintaining pH during the reaction on the value 5. The reaction took 14 h. How does (speed especially) the pH change during the process?
2. Does the crystalline modification of PY 15 influence the product's final properties?

3. New pigments from chapter 1 based on Cu and Zn are supposed to possess antimicrobial properties. However, the thesis does not contain information about such behavior. Can you comment on it?
4. Chapter 2, why only half of FA-06-07 and FA-07-07 was purified? And what happened with the other part when the yield of both products was higher than 96 %?
5. Can you comment the tables 5 and 6? I'm not sure about the method used for the barium determination in table 5. Are obtained values reliable for both methods?
6. How have you chosen only some prepared samples to compare with the commercial one? And how was the choice performed?
7. Can you comment on the anticorrosion properties of Mg-based perylene dyes? Why do the colorants with magnesium have higher anticorrosion properties? Is such an effect described in the literature? Is it connected with the lower metal loading in the colorant structure compared to Zn-based colorants? And finally, why were these metals chosen, as Ca-based salts are commercially prepared and applied?
8. Chapter 3, UV/Vis spectroscopy: Absorption values in table 22 do not correspond to values in figure 77. Can you comment on this? Can you explain the ϵ_{\max} parameter and its reason?
9. On page 126, I partly disagree with the statement that the crystals' shape confirms the samples' purity, as SEM shows only a small part of the samples. How was the purity of the samples in all cases determined? Typically, only the yield was presented.
10. Is the decomposition of chosen compounds by BQPER samples compared with the commercially available colorants? (figs. 88-90).

To summarize, the proposed dissertation thesis of ing. Fouzy Alafid contains enough experimental as same as discussion work. Moreover, the results are applicable on the industrial scale, which is supported by the patent production and strong cooperation with Synthesia, a.s.

I recommend the dissertation thesis for the defense.

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