



Univerzita
Pardubice
Fakulta
chemicko-technologická

Subj.: Opinion of the thesis supervisor

Undergraduate: Bc. Ondřej Zeman

Thesis title: Pyrotechnic Mixtures for the Production of Colored Smoke

1) Fulfillment of work goals and instructions of the supervisor

The main objective of the submitted work is to find the new, yet unused, dyes and pigments applicable for the production of red colored signal smoke. Student's effort was made in order to find functional non-anthraquinone based dye. Another work goal was to test the selected dyes in the non-traditional pyrotechnic heating system based on the potassium chlorate/sucrose. Selected mixtures should be tested in the real, industry used, large-scale product. Both above stated goals were fulfilled and student had followed supervisor instructions during all stages of experimental work.

2) Work progress, independence and the specific contribution of the student

Student had selected about 10 dyes and pigments having a potential to act as the functional smoke colorant. These chemicals were tested in the traditional sucrose/chlorate mixture in order to test the ability to produce the colored smoke. Based on these trials selected suitable dyes and pigments, which were further studied in the different pyrotechnics heating system. During the processing of the pyrotechnic mixtures student had to master and develop several practices necessary for the successful mixtures loading, such a granulation process, which rapidly speed up the production of the final pressed pellets. Student work independently and creatively solves the problems related with the chemicals availability, purity, etc.

3) The importance of work for practice or development of scientific discipline

The work is important for the practical production as it found a new chemical group suitable for the smoke production, which are potentially cost effective in comparison with the currently used dyes. It was also experimentally tested that the admixture of the suitable water soluble binder have no effect on the mixtures performance, but rapidly increases the comfort and tidiness of the manufacturing process.

4) Formal and language style

The student paid due attention to the formal level of work and strived to comply with the formal requirements for work. The work is clearly arranged and is correctly systematically divided. The listener expresses himself clearly and intelligibly.



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5) Final summary

The submitted final work is processed without significant shortcomings. I recommend the thesis for defense. Overall, I evaluate the level of access of the student and the result of his work with grade

A.

Pardubice, 31. 5. 2021

Ing. Vojtěch Pelikán, Ph.D.
b.o.h.