

Subj: MSc theses review

Title: Pyrotechnic Mixtures for the Production of Colored Smoke
Author: Bc. Ondrej Zeman
Theses supervisor: Ing. Vojtech Pelikan, Ph.D.

1. **Brief theme description.**

The main goal of this Master thesis was research in the area of red smoke formulations for potential use in pyrotechnic colored smoke compositions.

2. **Formulation and fulfillment of goals, completeness of elaboration.**

In his mostly experimental work, the candidate evaluated many new pyrotechnic red smoke formulations based on 10 different red dyes, two anthraquinone dyes, two pyrrolo-pyrrole dyes and six azo and hydrazo compounds. All formulations were characterized properly on the basis of their combustion behavior (burn time, figure of merit etc.).

3. **Selected method of solution, its originality and accomplishment.**

The work has been carried out at good scientific standard with state-of-the-art techniques. All goals outlined in the introduction were fulfilled. Several new pyrotechnic red smoke formulations have been recommended.

4. **Difficulty and suitability of the solution, achieved results.**

The experimental work has been carried out at a very difficult time (Corona pandemic) with the labs being closed for many weeks / months. Despite this, the candidate managed to achieve an impressive amount of experimental results. The candidate also included a good overview and literature research on the topic.

5. **Formal and language level of work.**

The thesis has been written in good and easy to understand scientific English. The work is well illustrated by a large number of good quality pictures.

6. **Questions, comments, objections.**

I have no objections at all.

Perhaps in future work the combustion products of the five chlorine-containing organic red dyes could also be evaluated in terms of the possible formation of tetrachloro dibenzo dioxines and related toxic compounds.

I hope the work is going to get published in an international journal. Here, the candidate could also cite our work on colored smokes that has been carried out in collaboration with Pardubice: <https://doi.org/10.1002/anie.202007489>

7. **Overall evaluation.**

Excellent experimental work of international standard. From the thesis, my feeling is that the student is very creative and ambitious. I sincerely hope he will stay in the area and continue with a Ph.D.

I recommend **submit** the thesis for the defense and I am giving a final grade **A**. I highly recommend to the Faculty to accept the master thesis handed in by Bc. Ondrej Zeman to accept without any conditions and to award the candidate (also with respect to the limitations in the current Corona situation) with the highest possible mark **A**.

In ...Munich...date...May 15th 2021.



Signature (b.o.h.)

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