

**CHARLES UNIVERSITY
FACULTY OF PHARMACY IN HRADEC KRALOVE**

Department of Pharmaceutical Technology

Study program: Pharmacy

Opinion of the Opponent of the Diploma Thesis

Year of the defense: 2023

Student: **Brooke Alexandra Dunlap**
Thesis Tutor: Assoc.Prof. Zdeňka Šklubalová, Ph.D.
Consultant: Sebastien Bailey
Opponent: PharmDr. Petra Svačinová, Ph.D.
Thesis title: **The influence of micronized poloxamer on the flow and compaction of a model tableting mixture**

Scope of work, number of 72 pages, 15 figures, 7 tables, 131 citations

Evaluation of the work:

- | | |
|---|-----------|
| a) Processing of the theoretical part: | Excellent |
| b) The complexity of the methods used: | Excellent |
| c) Preparation of the methodological part (clarity, comprehensibility): | Excellent |
| d) The quality of the experimental data obtained: | Excellent |
| e) Processing of results (clarity): | Excellent |
| f) Evaluation of results, including statistical analysis: | Very good |
| g) Discussion of results: | Very good |
| h) Clarity, conciseness, and adequacy of conclusions: | Excellent |
| i) Meeting the objectives of the work: | Excellent |
| j) Quantity and up to date of references: | Excellent |
| k) Language level (stylistic and grammatical level): | Excellent |
| l) Formal level of the work (text structure, graphic design): | Excellent |

I recommend the thesis for recognition as a rigorous thesis

Comments on the evaluation:

Theoretical part of the thesis describes the excipients used in tableting mixtures focusing on materials used in the experiment. It also summarizes the methods of powder and tablet evaluation from powder flow and compression to tablet testing. The theoretical part is written clearly and contains relevant information, that is supported by a large number of sources from the available literature. In the experimental part the effect of micronized poloxamers on the flow and compaction is studied. Results are clearly presented in tables and figures and discussed, however in the part of discussion dealing with compression and tablet properties I would appreciate more comparison with available literature sources. The list of references is confusing, the book chapter should be cited in a different format to make it clear (in most cases it looks like a new reference when authors of the chapter are listed at the beginning of the line).

Questions and comments to student:

Formal comments:

Microcrystalline is written as one word (p.14); Fig.1 magnification 500m (p.15), AOR vs. AoR (p.33,34,44), the unit for E1 in table 6 - N, should be Nm

The mass of samples was 0.5000 g with precision 0.1 mg (0.0001 g). But samples were between 0.5085 g and 0.5015 g. (p.34)

The abbreviation d0 is described as tablet density at h0, however in the text (p.34) is used as diameter. Diameter is not measured by the software.

The abbreviation D in formula 7 is not specified. Dimensions of tablets were measured in different phases of compaction, e.g. h24 is after 24 hours and D is not described.

Axes in Fig. 9 and 10 are hard to read.

The tensile strength is not only diameter dependent; in table 7, tensile strength is presented, not crushing force. (p. 54)

Questions:

How is the sensitivity to lubricants evaluated?

MCC and LAC are often used in coprocessed materials. Can you describe this type of materials, what are their benefits or disadvantages?

True density of samples was measured using dried powder. Bulk density was measured in graduated cylinder using undried sample and values were used to calculate porosity of powder bed. How can moisture affect the density of powder and wouldn't it be more appropriate to use the same sample (dried or undried)?

Is it possible to compare LOD of MCC/L and samples containing poloxamers, when it was measured at different setting? (p. 28, Fig.6)

There are also some differences in E2 energy, but it is not described in discussion. Can you add some brief explanation? E1 and E3 energies are discussed.

How was the effect of Poloxamer on the ejection force evaluated? - p.51 "As can be seen from the Fig. 15, the effect was lower under 10 kN when higher concentration was used. The best effect was observed, surprisingly, at the lowest concentration 0.5 %." It is not clear from the figure.

Evaluation of the thesis: Excellent

**For the Recommend
defense:**

In Hradec Králové

18. května
2023

signature of the opponent