

**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: 2024

Student: **Mehrdad Mirzaei**  
Thesis Tutor: doc.PharmDr. Zdeňka Šklubalová, Ph.D.  
Consultant: Dr. Pawel Stasiak, Ph.D.  
Opponent: PharmDr. Petra Svačinová, Ph.D.  
Thesis title: **Study of coating mixture composition on quality of tablet coat**

Scope of work, number of 48 pages, 13 figures, 5 tables, 43 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):                                     | Very good |
| 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:**

The aim of the study is to develop a TiO<sub>2</sub>-free coating for pharmaceutical tablets. Theoretical part of the thesis describes the tablet coating techniques and excipients used during the process including the titanium dioxide role in coating. It is written clearly and contains relevant information, that are supported by number of sources from the available literature. In experimental part, different types of tablets were prepared and coated by two different coating mixtures. Subsequently, the coating dynamics, mechanical properties of tablets, disintegration and appearance were evaluated and compared. Results are presented in tables and figures and described, however I would appreciate more comparison with available literature sources and in some case more detail explanation of results (e.g. the mechanical properties of tablets) and according to my opinion, figures 8, 9 and 12 are not accurate.

**Questions and comments to student:**

P.8: List of abbreviations - wrong temperature unit (° vs °C), the API abbreviation is missing

P.24: Lactose SD 14 is not included in materials. What type of lactose is it?

What is the difference in orange and green core composition? Is it just the API content or other substances as well? It is not clear from the description.

In what concentration is TiO<sub>2</sub> used for tablet coating? What was the concentration of lactose and calcium carbonate in coating mixtures? Was lactose completely dissolved in the coating mixture?

How can particle size and shape (in the case of insoluble materials used in coating mixture) affect the coating layer properties (thickness, plasticity/fragility, structure)?

Fig. 8, 9 and 12: Error bars are not included. X-axis description seems to be not accurate. According to the results, it is neither the diameter of the tablet nor the thickness of the coating layer (fig. 9 and 12 description). What do the values on the x-axis represent and how can you determine the coating layer thickness?

If the values are based on tables 1 and 2, then they do not correspond to the stated values. E.g. comparison of B1 and B2 - according to Table 2 (fig.8), values should be the same, comparison of A1 and B1 (fig. 9) - parameter D should be the same, for parameter D B2 the value should be 0.03. Can you explain it?

Can you explain the statement "... greater amount of coating suspension is required to achieve the target value used for lentile-shaped cores " (p.35), when the coating should be 7.54 mg (i.e. 3 %, p.28,32) for both types of cores?

Can you explain the higher resistance to crushing for A1 sample (lactose coating) compared to A2 (calcium carbonate coating)?

Based on your results, is it possible to recommend one of the coating mixtures as more advantageous?

**Evaluation of the thesis: Excellent**

**For the  
defense:**

**Recommend**

In Hradec Králové

27. srpna  
2024

signature of the opponent