



To whom it may concern

REVIEW

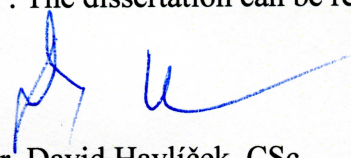
of the foreign scientific consultant Doc. RNDr. **David Havlíček**, CSc., Associate Professor at the Charles University (Prague, Czech Republic) on the dissertation of **Satpayeva Zhaarkul Bolsynbekovna** on the topic «Directed synthesis of new biologically active substances based on *o*- and *p*-hydroxybenzoic acid hydrazides», submitted for the degree of doctor of philosophy (PhD) on the specialty «6D060600 - Chemistry».

One of the promising directions to progress for the new highly effective biologically active substances is modification of the known compounds. The structure of these molecules is able to add various functional groups into their structure. In this connection, derivatives of salicylic acid are of interest, in particular *o*- and *p*-hydroxybenzoic acid hydrazides. Derivatives of salicylic acid are used in medicine as the antifever, anti-tuberculosis and anti-inflammatory drugs or analgetics. The structure of *o*- and *p*-hydroxybenzoic acid hydrazides has high synthetic possibilities, which are able to lead to develop the methods for the synthesis of new compounds with various pharmacological active properties.

Urgency of this theme developed by the candidate is beyond doubt. The materials presented in the thesis demonstrate that the candidate executed excellent work. The application of IR, one-dimensional and two-dimensional ¹H NMR spectroscopy and X-ray diffraction analysis to determine the structure of the synthesized compounds permits not to doubt the reliability of the obtained results.

As a result of the biological research, some substances with high antioxidant, antimicrobial, anti-inflammatory activities were found. Some compounds may be used as the inhibitors.

I am sure, that this work of Satpayeva Zh.B. "Directed synthesis of new biologically active substances based on *o*- and *p*-hydroxybenzoic acid hydrazides" was performed at a high scientific level, and the results obtained are both of theoretical and practical significance. It represents a complete scientific research and it fully complies with the requirements for writing of papers for the degree of doctor of philosophy (PhD) on the specialty "6D060600-Chemistry". The dissertation can be recommended for public defend.



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