ABSTRACT

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Title:	Forced degradation study of 1-aminohydantoin hydrochloride using HPLC method

Forced degradation, also called stress testing, is a helpful practice carried out in order to explore changes to a drug substance under excessive external stress condition. This thesis focuses on content and characteristics of forced degradation studies and description of the HPLC method in theoretical part and on the study conducted in JSC OlainFarm with the substance 1-Aminohydantoine hydrochloride (AHH) in the experimental part. There is only one known impurity 2-semicarbazidoacetic acid (SAA), which is a starting material and potential product of degradation. The aim of the study is to reveal the behavior and degradation pathways of AHH under stress testing.

First, the samples of AHH were prepared and exposed to stress conditions which included pH, oxidation, light, heat, combination of heat and humidity. Then, they were analyzed by previously developed HPLC method which showed the decrease of the substance and possible presence of impurities. Acquired data were compared with blanks that underwent the same conditions and with unstressed samples.

The study results showed the substance was most unstable in the presence of acid and base. After exposure to light, elevated temperature and at a combination of elevated humidity and temperature, the substance was more stable. During oxidation tests the used method was inappropriate, and therefore insufficiently accurate. The presence of SAA was observed after exposure to base and at elevated temperature of the substance in solution. The final outcome showing stability of AHH and presence of impurities including SAA can be useful for establishment of stability indicating and impurity monitoring methods during subsequent formal stability studies and other developmental processes.