- theoretical foundations of hydro mechanical, thermal, mass transfer, mechanical processes,

- Intensification of typical technological processes, their optimization, scaling, as well as energy supply and environmental issues.

In the process of studying the discipline "Processes and devices of chemical and pharmaceutical production" applicants apply knowledge obtained in the disciplines of inorganic, organic, physical and colloid chemistry, higher mathematics, physics, engineering and computer graphics, engineering technology in the design process.

As a result of studying the academic discipline, a candidate for higher education should know:

- fundamentals of the theory of transfer of momentum, heat, mass, theory of physical and mathematical modeling of the processes of pharmaceutical technology;

- fundamentals of the theory of hydrodynamics and hydrodynamic processes and apparatus: the basic equations of a liquid, the hydrodynamic structure of flows, the movement of liquids, the compression and movement of gases, the separation of gases, liquid and gas inhomogeneous systems, mixing in liquid media;

- fundamentals of the theory of heat transfer: industrial methods of supply and removal of heat in biotechnological equipment: the choice and calculation methods of heat exchange equipment;

- The basics of the theory of mass transfer and methods for calculating mass transfer equipment with a free phase boundary: absorption, distillation and rectification, extraction.

- mass transfer processes with a fixed surface of contact of phases: adsorption, drying, ion exchange, dissolution and crystallization, membrane processes of biotechnology.

Also he should be able to:

- determine the hydrodynamic characteristics and hydrodynamic structures of the flows;

- to compile the heat and material balances of biotechnological apparatus and installations;

- selection of pumps, gas blowers and compressors for biotechnology processes;

- calculate, select equipment for the separation of gas and liquid inhomogeneous systems;

- calculate the thermal mass transfer apparatus with the study of their basic dimensions;

- select and calculate equipment for cleaning up to an appropriate level of wastewater and gas emissions from biotechnological and other industries.

Conclusions. Thus, the study of the discipline «Processes and equipment of chemical and pharmaceutical production» will allow the future specialist to be competitive in the labor market and to perform their professional duties at a high level.

THE DEVELOPMENT FEATURES OF ORALLY DISINTEGRATING TABLETS

Zupanets I. V., Kolisnyk T. Ye.
Scientific supervisor: prof. Ruban O. A.
National University of Pharmacy, Kharkiv, Ukraine
ivzupanets@gmail.com

Introduction. Creating new drugs and improving existing ones in the modern solid dosage forms is a direction of pharmaceutical science and practice, which presents an urgent interest. Orally disintegrating tablets (ODT) belong to promising dosage forms which popularity is rapidly increasing among patients and doctors. This is due to the fact that ODT have better patient acceptance and compliance and may offer improved biopharmaceutical properties, improved efficacy, and better safety compared with conventional oral dosage forms. However, there may be certain challenges during pharmaceutical development of ODT which should be solved for successful realization of their advantages.

Aim. To carry out literature review on ODT creation and development.

Materials and methods. The literature search was carried out using scientific databases, namely PubMed and ResearchGate.

Results. The critical aspects in ODT creation and development include:

1. ODT should have sufficient mechanical strength along with rapid time of disintegration in small amount of water;

2. The use of ODT in oral cavity causes the need to provide pleasant taste and tactile sensations during administration of this dosage form;

3. Due to the fact that ODT, as a rule, incorporate substances intended for rapid disintegration in a minimum amount of liquid, often this dosage form is characterized by increased sensitivity to environmental factors, especially high humidity and temperature. This creates the preconditions for the choice of weatherproof packaging.

In the case of ODT, achieving the optimum tablet hardness is possible when using of two approaches – the addition of excipients (primarily, fillers) to the formulation and the selection of pressure on the tablet machine. Often, both methods are used to provide the required strength of a tablet with a high rate of disintegration in the oral cavity.

The flavor and tactile qualities of the active pharmaceutical ingredient (API) are critical attributes, since the patient's compliance and the absence of negative associations with treatment depend on the primary sensations. The particles of substances formed after the disintegration of ODT should be as small as possible and not remain in the oral cavity. The addition of flavors and cooling agents to the ODT formulation improves tactile perception in the oral cavity.

Different techniques have been developed to improve the taste, among which the mainly applied for ODT are the following ones:

1. Masking with flavors, sweeteners and amino acids;
2. Polymer coating of the preparation;
3. Microcapsulation.

In order to quantify the taste index, the following methods were described in the literature:

1. Panel testing (a subjective sense of a person);
2. Measurement of the reaction of the nerve impulse to taste;
3. Multi-Channel Sensor ("Electronic Tongue");
4. Spectrophotometric evaluation.

Conclusions. Orally disintegrating tablets have better patient acceptance and compliance and may offer improved biopharmaceutical properties, improved efficacy, and better safety compared with conventional oral dosage forms. Besides, ODT products may help to overcome the difficulty in swallowing conventional tablets among pediatric, geriatric, and psychiatric patients with dysphagia. The potential for such dosage forms is promising because of the availability of new technologies combined with strong market acceptance and patient demand. However, the successful development of ODT requires to take into account certain specific attributes of this dosage form. Among them the principal ones are sufficient tablet hardness along with the shortest disintegration time, as well as pleasant taste and tactile sensations during administration of ODT.