СУЧАСНІ ДОСЯГНЕННЯ ФАРМАЦЕВТИЧНОЇ НАУКИ В СТВОРЕННІ ТА СТАНДАРТИЗАЦІЇ ЛІКАРСЬКИХ ЗАСОБІВ І ДІЄТИЧНИХ ДОБАВОК, ЩО МІСТЯТЬ КОМПОНЕНТИ ПРИРОДНОГО ПОХОДЖЕННЯ

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DEVELOPMENT OF A TECHNIQUE FOR CONTROLLING THE INGREDIENT COMPOSITION AND INDICATORS OF QUALITY AND SAFETY OF THE GLUTAMIC AMINO ACID DIETARY SUPPLEMENT

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Introduction. The modern market of dietary supplements is characterized by a rapid increase in the consumption of amino acid complexes. Glutamic acid is a critical neurotransmitter and a key participant in nitrogen metabolism. Given its physiological significance, the development of precise analytical techniques for verifying the dosage and chemical purity of such supplements is a vital task for ensuring consumer safety and preventing falsification. Current regulatory frameworks require strict adherence to safety protocols to mitigate risks associated with chemical and biological contaminants.

Materials and Methods. The study focuses on the development of a unified control system for glutamic acid supplements in powder and capsule forms, based on national technical conditions.

- Identification: High-Performance Liquid Chromatography (HPLC) with UV detection was employed to confirm the presence of L-glutamic acid, following optimized international reference methods.
- Quantitative Analysis: A non-aqueous acidimetric titration method was optimized to provide high reproducibility, aligned with pharmacopeia standards [1, 2].
- Safety Testing: Atomic absorption spectrometry was used to monitor heavy metal concentrations (Pb, Cd, Hg, As) to ensure compliance with hygiene regulations.

Results and Discussion. The research established optimal chromatography conditions: a specialized ion-exchange column and a mobile phase consisting of phosphate buffer (pH 2.5), which correlates with established ISO procedures for amino acid determination. These parameters allow for the clear separation of the target amino acid from potential technological impurities. Regarding safety indicators, the maximum permissible levels of microbiological contamination were defined. Stability tests conducted under "accelerated aging" conditions helped establish a guaranteed shelf life and specific storage requirements, ensuring the product remains stable within the defined quality parameters [1].

Conclusion. The proposed technique offers a comprehensive approach to quality control, integrating physical, chemical, and microbiological analyses. The practical application of this method in manufacturing environments ensures that the dietary supplement meets strict regulatory requirements for ingredient transparency and toxicological safety, as mandated by both national and international standards [2].

References:

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