ELECTRICAL ASPECTS AT THE ELECTROACTIVATION OF DISPERSED MEDIA

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The negative consequences of the activities of industrial enterprises that produce waste and, in particular, its disposal or reuse is a major problem, which, in the context of the circular economy, requires the processing of waste/by-products that is a complex approach to meet consumer and governmental requirements. The use of electrochemical methods, in particular, electroactivation, allows solving a number of ecological problems, beneficial in alternative industrial processes, environmental protection, and pollution monitoring. Electrotechnologies are said to be harmless at the processing of by- products [1].

Electroactivation as a sustainable method for processing dispersed media, in particular, by-products such as whey and other food residues, for example, the recovery of whey proteins, is an alternative which can be a replacement for conventional methods. The results of the research regarding the establishment of the factors that influence the electroactivation of whey, the understanding of the physico-chemical and biochemical processes that are carried out when the electric current passes through a dispersed medium with a complex biological structure such as whey, allowed us to develope the principles and the construction scheme of some electrolyzers with different geometric configurations and constructive parameters, adapted to the particularities and technological requirements of the processing of secondary dairy products with the extraction of mineral protein concentrates and the simultaneous isomerization of lactose into lactulose. Different types of electrolyzers with certain geometrical/constructive parameters have been investigated, which allows the non-residual processing of whey [2]. The main electrical parameters such as voltage, energy consumption, specific energy consumption per unit volume, and volumetric electric current density are mainly influenced by the volume of the processed whey, the constructive/geometrical parameters (with parallelepiped or semi-cylindrical casing) of electrolyzers, the solid content of the initial whey, and the volume of the secondary liquid (anode liquid). The different and non-uniform recovery of whey proteins in mineral protein concentrates at the electroactivation of different types of whey in different electrolyzers is conditioned by the properties of each individual fraction and their behavior during electrochemical activation.

The optimization of electrical and constructive parameters is a decisive factor in the study of the electroactivation of different types of whey processed in different electrolyzers, which influences the recovery of whey proteins into mineral protein concentrates and the simultaneous isomerization of lactose into lactulose.

Keywords: electrical parameters, lactulose, proteins, whey

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