



MULTI-STAGE BUBBLE EXTRACTOR WITH INCREASED CONTACT TIME

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<https://doi.org/10.5281/zenodo.6802019>

ARTICLE INFO

Received: 28th June 2022

Accepted: 01st July 2022

Online: 06th July 2022

KEY WORDS

mixing zones, hole diameter, wall thickness, number of holes, gas velocity, gas cushion.

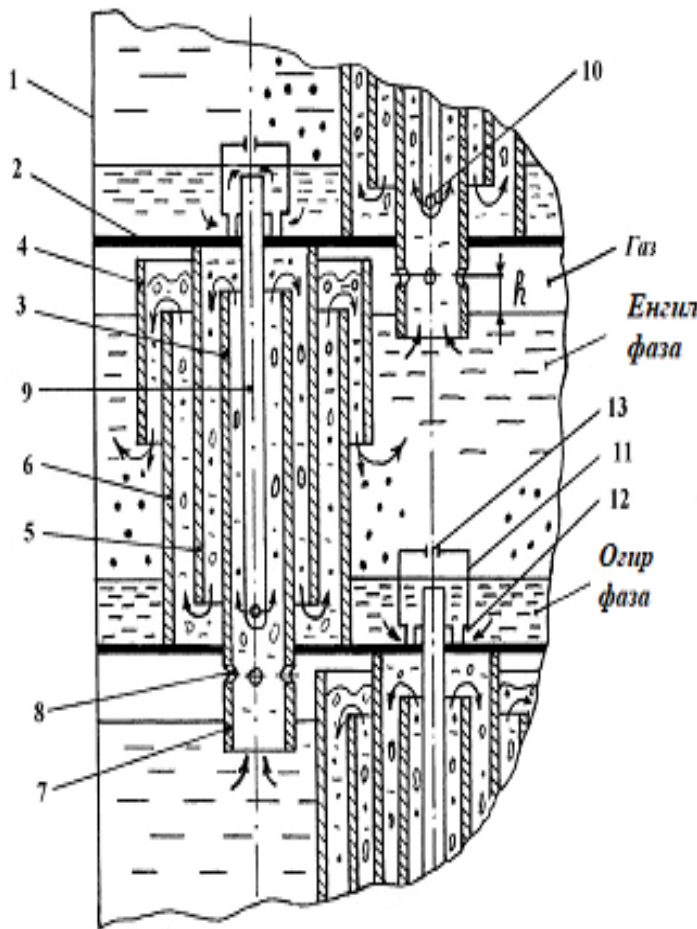
ABSTRACT

The article describes the design and operation of the extractor of the created multi-stage bubbling extractor.

Introduction

On additional measures to improve the state management system in the field of chemical industry, in particular"on the basis of the rapid development of processing industries focused on the production of finished products with high added value based on the deep processing of local raw resources, the transition of the industry to a new stage in terms of quality,

its modernization and diversification, the wide application of resource and energy-saving technologies in practice"tasks aimed at [1] are defined. In this regard, it is urgent to carry out research in the direction of further modernization and diversification of the extraction process in the food and chemical industry by transferring it to new effective methods and equipment.[2,5,6,9,12]



1-device body; 2nd barrier; 3-internal nozzle; 4-external nozzle; 5, 6-middle nozzle; 7-gas distribution nozzle; 8- gas transmission hole; 9-heavy liquid pipeline; 10-heavy liquid hole; 11th bottom hole; 12th upper hole; pipe; 13-air outlet.

Additional inner 5 (odd) and outer 6 (even) concentric nozzles are inserted between these nozzles.

The internal pipe 5 is fixed to the upper barrier 2 by welding and a gap is formed with the lower barrier. The external mixing nozzle 6 is fixed to the lower block 2 by welding and a gap is formed with the upper block. The lower part of the internal nozzle 3 is inserted from under the barrier 2, and holes 8 are opened in its side walls and serve as nozzles 7 for distributing gas to the mixing

Based on the above requirements, we created a new design of multi-stage bubble extractor [2]. Below is the structure and principle of operation of the newly created apparatus.

The structural structure of the bubble extractor and the working principle are as follows.

The extractor body 1 is divided into separate mixing and settling stages by means of barriers 2. Barrier 2 is equipped with internal 3 and external 4 mixing concentric nozzles and a gap with upper barrier 2 is formed.

Figure 1. Multistage bubble extractor with increased contact time

zones of the apparatus.[12,16,18,22] Also, heavy liquid discharge pipes 9 are installed on the barrier 2. In the lower parts of these pipes, holes 10 are opened for the flow of heavy liquid. The upper part of the pipe 9 is closed with a cap 11. Caps have bottom 12 and top hole 13.

In order to ensure the operation of the extractor in the standard hydrodynamic mode, the cross-sectional size of the channel between nozzles 3 and 5 is determined by the condition that the velocity of liquid phases in this channel is greater than the velocity of gas bubbles.[23,24,25,28,29]

The industrial application of this multi-stage bubble extractor increases the efficiency of the extraction process. There is no need to increase the number of



mixing and grinding steps to achieve the goal.

Conclusion

The installation of the filter in the mixing zones of the apparatus ensures the stability

of the consumption of heavy liquids in the stages, the normal mass exchange process and the clean separation of the extracted liquids from the apparatus.

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