

CONSTRUCTIVE ANALYSIS OF PLATE COLUMNS

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ABSTRACT	KEYWORDS
In the article fractionation in a rectification column in a laboratory device separation methods are studied. Separator rectification using steam the construction of the column, the principle of operation is given. Rectification column allowing separation of acetic acid without losses in continuous operation.plate constructions are studied.	Rectification, column, plate, heat exchange, ethyl acetate, steam, contact surface, grid.

Introduction

The rectification column of the chemical and oil refining industry uses a plate rectification column with a different structural structure. Several horizontal barriers, i.e. plates, are installed in the inner part of the column with plates at the same intervals along its height, Fig. 1. Depending on the flow of liquid from one plate to another, plate columns have a pouring device and no pouring device. In the pouring device, the liquid is fed to the plate in the upper part of the column, and this liquid passes from the plate to the plates through a special device and leaves the lower part of the column. The contact surface of gas and liquid in these plates is small.

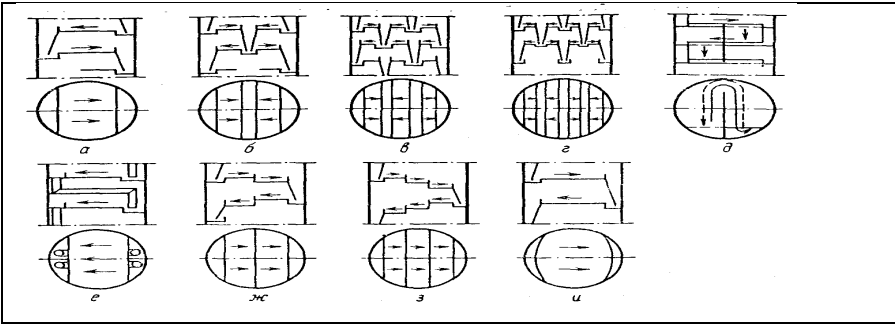


Figure 1.

Schemes of liquid flow on plates with a pouring device: a-single flow; b-two-flow; v-three-stream; g-four stream; d-ring movement; one-way movement on adjacent plates; j,z-step-like movement; Movement through a sickle-shaped flow barrier.

Plates are selected according to the physico-chemical and hydraulic flow process, depending on the field of application of rectification column devices in chemical and oil refining industries. Ball-shaped, Sieve-like, Capped, Plated, Rolled.

The structure of the turntable is simple, it is difficult to assemble, repair and monitor.

The holes of the sieve plates get dirty and quickly become clogged with sediment. If the gas velocity or pressure is suddenly reduced or stopped, all the liquid in the plates will flow to the lower plates and the column will be refilled to continue the process. Compared to sieve plate columns, hooded plate columns operate more stably in the long term even when gas mixtures are dirty.

Capped plates have a complex structure, high hydraulic resistance, difficult to clean, expensive, and work poorly when the amount of supplied gas is low.

In plate plates, the phases have the principle of moving in one direction only.

Because each stage works in the right direction, it can increase the consumption of gas and liquid.

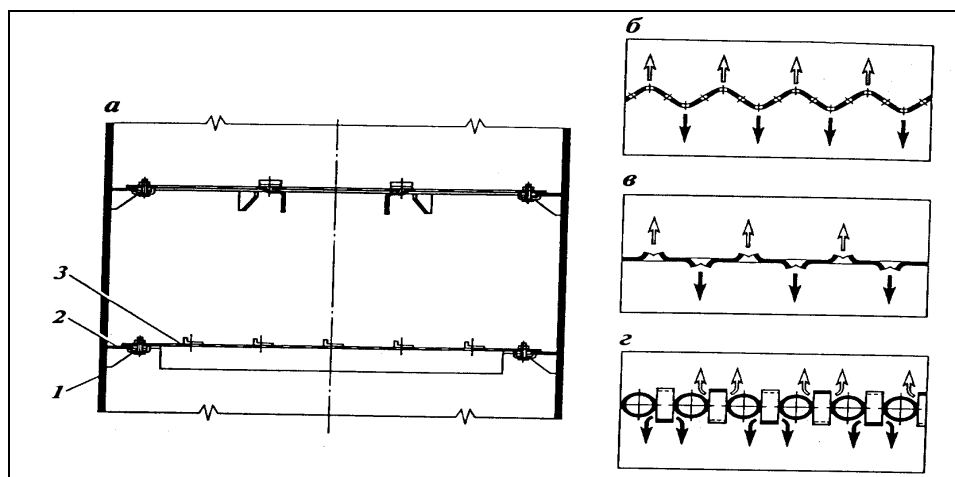


Figure 2.

Schemes of flipping plates: plate with a grid; b-wave sieve plate; plate with curved edges of v-slots; tubular grid plate equipped with g-fold folded tape; 1st column shell; 2nd base ring; Plate 3 section.

If the speed of the gas in the plates of the tipping type is increased further, due to the increase in the friction between the gas and the liquid, the accumulation of the liquid in the plate increases suddenly, the hydraulic resistance also increases suddenly, as a result, the liquid gets stuck in the plate and the plates can break and spill.

These are gridded, wave-shaped sieves, the edges of the slits are curved, tubular-grids provided with multi-fold tape. Fig. 2 shows the relationship between the hydraulic resistance of the turntable and the gas flow rate in the column. When the gas velocity is low, the liquid is not trapped in the plates, because the friction force between the phases is small. In this range of gas speed, the plate works normally. At this time, gas and liquid alternately pass through one hole. Structural analysis showed that in chemical enterprises, tilting plate columns are widely used. This tilting plate column apparatus can be used to increase the strength of the surfaces of the plate section and reduce the hydraulic resistance. Figure 1,

which can be applied to a tumbling plate casting device, shows a single-flow, d-ring motion, e-unidirectional motion in continuous plates, i-sickle-shaped casting network. It corresponds to the principle and constructive aspect of action, methods through power.

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