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ХАРЧОВИХ ТЕХНОЛОГІЙ

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Головний редактор, д-р техн. наук, професор
Заступник головного редактора, канд. техн. наук, доцент.
Відповідальний редактор, д-р техн. наук, професор

Б.В. Єгоров
Н.М. Поварова
Г.М. Станкевич

Редакційна колегія
доктори наук, професори:

Р.В. Амбарцумянц, А.Т. Безусов, С.В. Бельтюкова,
О.Г. Бурдо, Л.Г. Віннікова, О.І. Гапонюк,
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О.О. Коваленко, Г.В. Крусір, Д.О. Жигунов

доктори наук:

Одеська національна академія харчових технологій
Збірник наукових праць молодих учених, аспірантів та студентів
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РОЗДІЛ 2

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MINT DRYER CAPACITY OF 10 KG IN THE FINISHED PRODUCT PER HOUR

Vashchenko Y.K., student EQL «Bachelor» Faculty IM&PT
National University of Food Technologies, Kyiv

Different taste and aromatic substances contained in fruits and vegetables are of great importance in human nutrition. They significantly improve the taste of food, which contributes to its understanding.

Most fruits and vegetables can not long be kept fresh. They deteriorate as a result of exposure to enzymes and microbes. Long-term storage of fruits and vegetables may help with drying.

The research object is drying cabinet that is constructed from analogue of domestic production and consists of two parts top – and bottom pyramid – in the form of a rectangular parallelepiped.

The design is completely made of standard grades. For smaller heat insulation and dryer separately, which significantly reduces power consumption.

The upper cabinets installed channel fan that provides full supply of the required amount of air in the drying chamber after passing electric.

As a result of the settlement was set optimal operation which involves heating the air temperature to 60 °C, air flow up to 112 kg/h, and the drying about 4 hours, (cube measuring 10×10 mm).

Also had a decisive relatively small size cabinet that can create its installation in limited areas of operation.

To repair the air system nodes do not need to spend maximum effort as components are easily accessible which greatly reduces labor costs and reduces downtime.

In these settings dryer capable of drying vegetables provided that they are washed, cut (cubes or slices) and lined with a thin uniform layer.

These meal (dried vegetables) may serve as a good addition to meals, because with a relatively long shelf life.

Particular attention should be paid to this production at the winter time, and plus a set of dry rations to soldiers for quick hot meals.

This design has been developed for small and medium enterprises that can meet the needs of consumers in the market and would be able competitiveness with similar foreign production.

Supervisor – Ph.D., Associate Professor Lulka D.M.

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DEPOLARIZING FIELD IN FERROELECTRIC POLYMERS AND ITS NEUTRALIZATION BY TRAPPED CHARGES

**Dzhakeli V.L., BSc student, Department P&M, Faculty TEPaTD
Odessa National Academy of Food Technologies**

Switching of polarization in ferroelectric polymers results in appearance of the depolarizing field tending to switch the polarization back to its original state [1]. If the depolarizing field is not neutralized (or compensated) by trapped charges, or by other means, the residual polarization is weak and unstable, because the main polarizing field and the depolarizing field have opposite directions.

There are two sources of space charges in ferroelectric polymers. They can either originate from separation of already existing intrinsic carriers, or be injected in the bulk through surfaces of the sample. It was proved [2] that the massive trapping of charges occurs during the buildup of polarization in ferroelectric polymers, but it is not clear where the trapped charges reside.

It is shown in this paper that favorable conditions for trapping exist not only at boundaries of the polarized crystallites, but also in macroscopic transition zones, by which polarized parts of the sample are separated from non-polarized ones. Depending on poling conditions, the zones are located either near surfaces, or inside the volume. We found that the charge density necessary to compensate the depolarizing field does not depend on thickness of either the transition zone, or the polarized volume. Assuming that compensating charges are trapped at boundaries of crystallites and considering that ferroelectric polymer has a brick-like structure [3], we found that the charge density necessary to provide for complete compensation must be about $3 \cdot 10^{26} \text{ m}^{-3}$, which is 10^8 times higher than the total charge available in the sample.

It means that all compensating charges cannot be trapped at the boundaries of crystallites, but they reside, most probably, in the transition zones. We calculated that the field acting at a dipole inside a crystallite was zero in this case. At the same time, the second component of polarization appears under action of rather high field applied to the amorphous phase of the ferroelectric polymers, although it is not as large and stable as the ferroelectric polarization in crystallites.

We calculated that the charge density of about $3 \mu\text{C}/\text{m}^2$ can be obtain by separation of the intrinsic charges, but this value is much lower than that necessary for compensation of the depolarizing field estimated as $0.1 \text{ C}/\text{m}^2$. It means that additional charges are needed which can be supplied either by injection, or by thermal stimulation during poling. Considerable decrease of the apparent conductivity in ferroelectric polymers observed at different poling conditions was in good agreement with our model calculations.

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Наукове видання

**Збірник наукових праць
молодих учених, аспірантів
та студентів**

Головний редактор акад. Б.В. Єгоров
Заст. головного редактора, канд. техн. наук Н.М. Поварова
Відповідальний редактор акад. Г.М. Станкевич
Технічний редактор Т.Л. Дьяченко