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МЕТОДЫ ОПРЕДЕЛЕНИЯ БАРЬЕРНЫХ СВОЙСТВ ПИЩЕВЫХ ПЛЕНОК (ОБЗОР)

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Приведена информация о стадиях и основных количественных характеристиках процесса проникновения веществ через полимерные пленки (коэффициент диффузии, коэффициент растворимости, коэффициент проницаемости, энергия активации). Проанализированы факторы, влияющие на скорость данного процесса: свойства проникающей субстанции, состав и структура полимерной матрицы, внешние условия и т. д. Описаны методы оценки барьерных свойств полимерных пленок, используемых для создания упаковки для пищевых продуктов, по отношению к ряду пермеантов: кислороду, водяному пару, летучим органическим веществам и жирам. Предложен статический модифицированный метод оценки барьерных свойств пленок по отношению к летучим органическим веществам. Продемонстрировано, насколько барьерные свойства современных упаковочных материалов по отношению к данным субстанциям соответствуют основным требованиям к качественной упаковке. Дан анализ современных тенденций в области упаковки пищевых продуктов (биоразлагаемость, пригодность для употребления в пищу, улучшенные барьерные и механические свойства и др.). Приведены характеристики пленок на основе крахмала, поливинилового спирта и полилактида как материалов, активно внедряющихся в производство для создания экологически чистой упаковки, в том числе для пищевых продуктов.

Ключевые слова: полимерные пленки, продукты питания, упаковка, барьерные свойства, методы анализа.

METHODS FOR THE DETERMINATION OF BARRIER PROPERTIES OF FOOD PACKAGING FILMS (A REVIEW)

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The paper presents the information on the stages and main quantitative characteristics of the process of penetration of substances through polymer films (diffusion coefficient, solubility coefficient, permeability coefficient, activation energy); the factors influencing the rate of this process (properties of the penetrating substance, composition and structure of the polymer matrix, external conditions, etc.) are analyzed. Methods are described for assessing the barrier properties of polymer films used to create packaging for food products in relation to a number of permeants: oxygen, water vapor, volatile organic substances and fats; a static modified method for assessing the barrier properties of films in relation to volatile organic substances is proposed. It is demonstrated how the barrier properties of modern packaging materials in relation to these substances meet the basic requirements for high-quality packaging. The analysis of modern trends in the field of food packaging (biodegradability, suitability for food consumption, improved barrier and mechanical

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properties, etc.) is given. The characteristics of films based on starch, polyvinyl alcohol and polylactide as materials actively introduced into production to create environmentally friendly packaging, including for food products, are given.

Keywords: polymeric films, food products, packaging, barrier properties, methods of analysis.

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