газовой фазы для всех рассмотренных случаев принимали из расчета 300 м^3/ч в аппарате с внутренним диаметром 1000 мм. Расход жидкости задавали через плотности орошения насадки в диапазоне 1-35 л/(с·м). Установлены границы режимов устойчивого течения пленки.

Определены дальнейшие направления исследований и возможность применения полученных на данный момент результатов в практических целях: для проектирования нового и модернизации существующего контактного оборудования насадочного типа.

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PREPARATION AND CHARACTERIZATION OF CROSS-LINKED PECTIN NANOCAPSULES AS A DRUG DELIVERY SYSTEM

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Polymer nanocapsules (PNCs) are an important class of nanocarriers, but applications of conventional non-crosslinked PNCs have been significantly limited because they are susceptible to environmental conditions.

Synthesis and applications of crosslinked PNCs (CPNCs) with robust covalently stabilized nanostructures have attracted great interest over the past decade. Pectin has been used for nano-encapsulation of various bioactive materials using a wide range of different methods, because it has several benefits like being emulsion stabilizer, possessing gelling properties and binding abilities. Feng Ji et al. [1] developed a novel hollow pectin nanocapsules with excellent biocompatibility and pH-sensitivity via layer-by-layer assembly for anticancer drug delivery. Ji et al. (2017) developed a novel hollow nano-capsule with layer-by-layer method of pectin and chitosan for delivery of doxorubicin hydrochloride (anticancer drug). These nano-capsules had high loading capacity and possessed good biocompatibility and were sensitive to pH. Brinzolamide loaded chitosan-pectin nanocapsules were formulated efficiently by Vibhuti Dubey et al. [2] using polyelectrolyte complex coacervation technique. The pharmacodynamic studies concluded that the Brinzolamide loaded chitosan-pectin nanocapsules were

more able to enhance the corneal permeation by extending the drug residence time and improving the IOP reduction rate.

Our work is focused on the development of chemically crosslinked pectin nanocapsules via Ugi reaction in diluted liposomal suspension. Liposomes were used as template for the synthesis and hexamethylene diisocyanide as crosslinking agent. pH adjustment in the range of 5.5 – 6.5 is considered a significant parameter for the reaction proceeding. After formation of the polysaccharide envelop around liposomes using Ugi reaction, the lipid components can be hydrolyzed in alkaline media to obtain the crosslinked pectin nanocapsules. NMR spectroscopy was utilized to confirm the formation of the nanocapsules. Several factors such as pH, amount of the crosslinking agent, the concentration of pectin and the ultrasonication time were investigated to optimize the preparation conditions. The prepared nanocapsules are characterized by dynamic light scattering, zeta potential, PDI measurement and fluorescence microscopy. Thus, average diameter of the nanocapsules was in the range of 220 – 260 nm and zeta potential – 30 – 40 mV.

Therefore, the developed chemically crosslinked nanocapsules could be a promising nano-carrier for drug delivery.

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