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INVESTIGATION OF SEPARATION METHOD FOR AROMATIC SUBSTANCES OUT OF ESSENTIAL OILS

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ABSTRACT

Aroma of food products is created by aromatic substances that are naturally present in the raw material or formed during the technological process. Flavourings which are either isolated aromatic substances or their mixtures are used to impart smell to food.

Food flavourings can be natural, obtained by physical and microbiological processes and artificial, obtained by chemical processes.

Separation of natural aromatic substances in pure (isolated) form from natural sources that would be equivalent in their quality and value to artificial analogues, but not associated with a potential risk to consumers' health, is very perspective in the development of flavouring technologies.

The aim of the research was to develop a rational method of separation of natural aromatic substances out of dill and caraway essential oils and to investigate their organoleptic and physicochemical characteristics.

The rational separation of aromatic substances in pure form has required the sequential combination of three stages: vacuum rectification, preparative isolation and chromatographic control of purity of derived aromatic substances.

Essential oils have been separated into the clean-cut fractions by vacuum rectification on the packed column. About 30...90 % of the target aromatic substances have been accumulated in the clean-cut fractions by the experimental selection of such modes as cube temperature, residual pressure, and reflux ratio.

Because of irrelevance of vacuum rectification, preparative chromatographic separation has been used to separate the pure aromatic substances out of fractions. This process has been carried out by applying the packed column with the gradient of dispersion of solid support and concentration of stationary PEG-6000 phase along the length of the column. These solutions have allowed increasing the column efficiency to 590 theoretical plates. Aromatic substances have been separated with their purity up to 95 ... 98%.

Each stage of essential oil separation has been accompanied with chromatographic studies of composition of fractions and aromatic substances on the analytical column with the stationary dinonylphthalate phase.

The organoleptic and physicochemical properties of obtained aromatic substances have been investigated: solubility and stability in alcohol (96.3% vol.), aqueous-alcoholic solution with strength of 40% vol., water, kefir with a 3.2% fat content, and refined sunflower oil.

KEY WORDS

Aromatic components, essential oil, preparative separation, flavouring

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