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FACTORS AFFECTING THE COMPLETENESS AND SPEED OF EXTRACTION

Being an important chemical process extraction consists in the separation of a substance from a matrix. The partition theory describes the distribution of a solute within two phases is an equilibrium state. This is observed when the analyte moves from the water into an organic layer.

Types of extraction. There are different types of extraction: liquid–liquid extraction, solid-phase extraction, and acid-base extraction [2]. Undergoing liquid-liquid extraction compounds separate according to their relative solubility in two different immiscible liquid phases. This technique has been applied in several fields such as analytical chemistry and biology.

Components. Extractions often includes two immiscible phases to separate a solute from one phase into the other. Typical lab extractions are of organic compounds out of an aqueous phase and into an organic phase. Common extractants are arranged from ethyl acetate to water (ethyl acetate < acetone < ethanol < methanol < acetone : water (7:3) < ethanol : water (8:2) < methanol : water (8:2) < water) in increasing order of polarity according to the Hildebrand solubility parameter. The extract can be put back to dried form using a centrifugal evaporator or a freeze-drier [1].

The difference in concentration. The difference in concentrations in the raw material and the extractant is the driving force behind the extraction process. During extraction, it is necessary to strive for the maximum change in concentrations, which is achieved by a more frequent change in the extractant (remaceration, instead of maceration), by conducting an anti-flow process, by creating dynamic extraction conditions [3].

Time (duration) of extraction. From the basic mass transfer equation it follows that the amount of matter that was diffused through a certain layer is directly proportional to the extraction time. Excessive duration of the extraction process leads to the

contamination of extracts with adjacent macromolecular compounds, the diffusion rate of which is much smaller than that of biologically active substances, which, under the influence of enzymes, leads to the occurrence of undesirable processes.

Viscosity of extractant. By law, Fica is the amount of dissolved substance that has been diffused through a layer of an extractant, inversely proportional to the viscosity of this extractant at a given temperature. Consequently, less viscous solutions have greater diffusion ability. To reduce the viscosity of extracts during extraction of vegetable oils, heating is used.

Temperature. The increase in temperature accelerates the extraction process, but in the conditions of phytochemical production, the heating is used only for water lifts.

Selection of extractant. To ensure the completeness of the extraction of active substances and the maximum extraction rate to the extractant, the following requirements are put forward: selectivity (sample solubility); chemical and pharmaceutical indifference; low toxicity; accessibility [4].

Thus, in the process of extraction we distinguish some key factors that affect the completeness and speed of extraction. These factors are the difference in concentrations, duration of extraction, viscosity of extractant and temperature.

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