

Recent developments of membrane technology in the clarification and concentration of fruit juices

ABSTRACT

Fruit juices are traditionally processed thermally to avoid microorganisms' growth and increase their shelf-life. The concentration of juices by thermal evaporation is carried out to reduce their volume and consequently the storage and transportation costs. However, many studies revealed that the high-temperature operation destroys many valuable nutrients and the aroma of the juice. Currently, membrane technology has emerged as an alternative to conventional processes to clarify and concentrate fruit juices due to its ability to improve juices' safety, quality, and nutritional values. Low-cost, low-energy requirement, and minimal footprint make membrane technology an attractive choice for industrial adoption. The low-temperature operation that preserves the nutritional and sensorial quality of the juice can fulfill the market demand for healthy juice products. In this review, the pressure-driven membrane processes, including microfiltration, ultrafiltration, and reverse osmosis; osmotic distillation; membrane distillation; and forward osmosis that have been widely investigated in recent years, are discussed.