

EFFECTIVE AND MILD OSMOTIC DISTILLATION MEMBRANE DISTILLATION PROCESS WITH CASCADE OPERATION

Boor A.¹, Szigeti M.¹, Nemestothy N.¹, Belafi-Bako K.¹

¹ *Research Institute on Bioengineering Membrane Technology and Energetics, University of Pannonia, Hungary*

Membrane distillation (MD) is an emerging technology both in desalination and food industry field. It has relative high permeate flux - in case of membrane distillation - but has some drawback as well, high conductive heat losses high temperature polarization effect and risk of mass contamination of the permeate can be mentioned. It also has the possibility to use in combined system. One of these integrated methods is the osmotic distillation membrane distillation (ODMD). Together these two systems have more driven force than alone. Due this synergetic effect is more effective to apply membranes in this way, especially when it is used to concentrate some valuable materials like fermentation broth or fruit juices.

OD systems are usually operated in cascade way, mostly counter current flow, when the most concentrated juice or fermentation broth contact with the original brine and the original juice contact the most diluted brine.

OD and MD process can be utilised in flat sheet spiral wound or hollow fibre modules. Hollow fibres usually have more potential comparing them to the flat sheet membranes. Because they are scalable have more packing density and don't need any support layer. This kind of modules has smaller temperature polarization profiles than other membrane module types.