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Benzoic acid (C_6H_5-COOH) has been used widely in food industry and cosmetic industry as a preservative because of its antibacterial efficiency. Cranberry is rich in Benzoic acid, and the content of Benzoic acid is about 100ppm in the cranberry juice (10%Brix). The concentration implies that cranberry juice contains excess amount of Benzoic acid which can be utilized as natural preservative. Membrane separation technologies such as microfiltration, ultrafiltration and reverse osmosis have many advantages over other separation technologies because they require less energy and no heat treatment. Their application in food industries has been widely developed. If the excess Benzoic acid in cranberry juice can be separated with low cost by use of membrane separation technologies, it will be a promising material for natural preservative.

In previous research of reaction and separation engineering laboratory, NFRI, Benzoic acid rich solution could separate from Cranberry juice by using nanofiltration. However, puerility of Benzoic acid was still low and it's required more purification for use a preservative of food and cosmetics. And NFT-50 membrane which was most suitable nanofiltration membrane for separate Benzoic acid became the abolition from manufacture.

In this study, the efficient conditions of nanofiltration for purification of Benzoic acid from cranberry juice were investigated. At first, rapid analysis method using HPLC with UV detector for organic acids and RI detector for monosaccharide (sugar) was conducted. And eleven commercial nanofiltration membranes were tested with test cell (C60F, Nittodenko, Japan) for checking Benzoic acid separation ability under the high pressure (more than 3 MPa) from the model solution and straight cranberry juice. The effect of pretreatment by ultrafiltration (UF) also tested in separation test using straight cranberry juice. Furthermore, these results were checked with a pilot scale membrane separation system (DDS Lab Module Type 20 plate and frame system).

According to results of model solution separation test, DL, DK, "NF" and UTC-60 considered suitable for purified by second NF treatment. In NF treatment of cranberry juice, GR40PP which is a UF membrane showed good performance for pretreatment of NF because of keeping Benzoic acid (permeability of Benzoic acid) and high permeate flux on next NF test. Benzoic acid was purified by twice nanofiltration. The optimum conditions were using DK membrane at 5 MPa and pH 4.5 on 1st nanofiltration, and at 3MPa and pH 2.5 on 2nd nanofiltration. The concentration of each components after twice NF treatment were as follows; Benzoic acid 2.46 (3.34* ,*before NF)mM Malic acid 1.78 (37.9*) mM, Citric acid 0.14 (65.2*) mM, Fructose 0.13 (43.1*) mM, Glucose 0.44 (188.1*) mM. The purity of Benzoic acid benzoic acid was increased from 0.86 %(mol/mol) to 49.7 % (mol/mol) by twice NF at these conditions. The pilot scale test with Lab Module Type 20 was conducted with no pH adjustment on 1st NF for concentrated cranberry juice to use as other food materials such as juice, jam and etc. Under this condition, purity of Benzoic acid after twice nanofiltration became 32.5 % (mol/mol)

This study was investigated Benzoic acid was separated and purified from cranberry juice by twice nanofiltration. Moreover, no pH adjustment on 1st NF might be suitable for recover excess Benzoic acid and produce cranberry foods.