

## Development for Monitoring and Concentrated Separation of Endocrine Disruptors in Sea Water by Pervaporation Method

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Endocrine disrupting chemicals, such as dioxin and polychlorinated biphenyl (PCB), are affecting the development and reproduction of humans and animals, and are therefore, of major concern to the environment. In this work, separation from aqueous solutions of several endocrine disruptors such as dibenzo-*p*-dioxin, diethyl phthalate (DEP) and co-planar PCB (3,3',4,4'-tetrachlorobiphenyl, TCB) has been investigated by pervaporation.

Pervaporation experiments through polydimethylsiloxane (PDMS) membranes were performed using aqueous feed solutions of several endocrine disrupting chemicals. The theoretical relationship between  $\alpha$  (separation factor) and physical parameters (i.e.,  $\log p_{\text{vap}}$  and  $\log K_{\text{ow}}$  [octanol-water partition coefficient]) has been developed in this study. A relative good relationship ( $r = 0.883$ ) was obtained in the figure as theoretically predicted.

The endocrine disrupting chemicals in sea water at Enoshima Island were analyzed using GC-MS and pervaporation method (Fig. 1). We also succeeded to remove endocrine disrupting chemicals by pervaporation of sea water at Enoshima Island. In summary, hydrophobic endocrine disrupting chemicals, such as polychlorinated dioxin and PCBs, can be removed very effectively from an aqueous feed solution and aqueous salt solution using hydrophobic PDMS membranes by pervaporation.

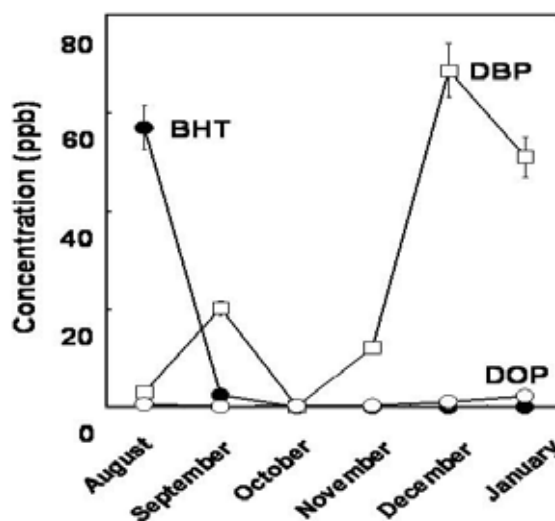


Fig. 1 Concentration of BHT, DBP and DOP in the sea water in every month.