

Important notes:

Do **NOT** write outside the grey boxes. Any text or images outside the boxes **will** be deleted.

Do **NOT** alter the structure of this form. Simply enter your information into the boxes. The form will be automatically processed – if you alter its structure your submission will not be processed correctly.

Do not include keywords – you can add them when you submit the abstract online.

Title:

Fabrication of laminar graphene oxide membrane on polyketone hollow fiber support for organic solvent nanofiltration

Authors & affiliations:

H. Monguchi, K. Nakagawa, T. Kitagawa, Y. Okamoto, A. Matsuoka,
E. Kamio, H. Matsuyama and T. Yoshioka
Kobe University, Japan*

Abstract: (Your abstract must use **Normal style** and must fit in this box. Your abstract should be no longer than 300 words. The box will 'expand' over 2 pages as you add text/diagrams into it.)

Laminar graphene oxide (GO) membranes have been reported to exhibit excellent performance in the field of water treatment^[1]. GO is also expected to be applied to organic solvent nanofiltration (OSN) because of its organic solvent tolerance^[2]. **In this study, for promotion of practical application of laminar GO membranes as OSN, we fabricated laminar GO membranes on hollow fiber support which have a large packing area per space volume and so that which are suitable for industrial use. The hollow fiber support is made of polyketone (PK) which has excellent resistance to organic solvents.**

Laminar GO membranes were fabricated by pressurized filtration on PK hollow-fiber support using a tubing pump. Membrane performances were evaluated with a cross-flow filtration apparatus. Rejection performances were measured using anionic dyes in water and methanol.

Cross-sectional SEM observation of GO/PK showed the formation of a layered structure of GO on the PK support membrane, with a thickness of about 30 nm (Fig.1a). The results of the membrane performance of GO/PK in water and methanol are shown in fig1b. The permeance of methanol is higher than that of water. This is due to the lower viscosity of methanol than that of water. It was found that EB rejection was lower in methanol than that in water. This may be due to the decrease of the effect of electrostatic repulsion between anionic dyes and GO in methanol. The GO/PK membrane obtained in this study showed around 10 times higher permeance than the previous GO membrane^[3,4]. Improved membrane performance can be expected by strengthening the stability of GO layer such as cross-linking.

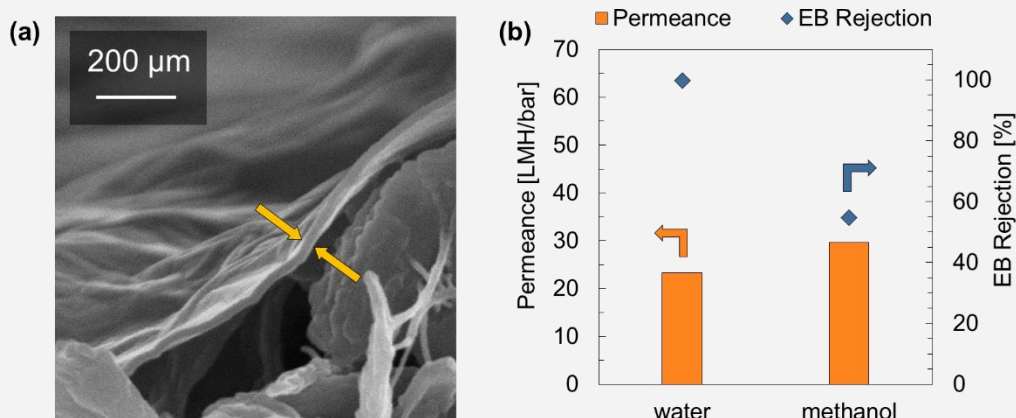


Fig.1 (a) Cross-section SEM image of GO/PK, (b) Performance comparison of GO/PK in different solvents

Important notes:

Do **NOT** write outside the grey boxes. Any text or images outside the boxes **will** be deleted.

Do **NOT** alter the structure of this form. Simply enter your information into the boxes. The form will be automatically processed – if you alter its structure your submission will not be processed correctly.

Do not include keywords – you can add them when you submit the abstract online.

References

- [1] Han, Y., *et al.*, *Adv. Funct. Mater.*, **23** 3693-3700 (2013).
- [2] Dreyer, R., *et al.*, *Chem. Soc. Rev.*, **39** 228-240 (2010).
- [3] Nakagawa, K., *et al.*, *Sep. Purif. Technol.*, **276** 119279 (2021).
- [4] Guan, K., *et al.*, *J. Membr. Sci.*, **660** 120861 (2022).