

## Magnetoelectric membrane filters of 2-2 type electrospun-PVDF/porous-Ni for effective removal of particulate matter

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Air pollution by particulate matter (PM) is being a serious problem over the world because PM has affected negative effects on public health and living environment. In order to reduce PM, fibrous PM filters have been usually developed by electrospinning of polymeric precursors into nanofibers. Recently, PM filters using electrostatic interaction between surface of the fibrous filter and PM have been attractive due to their high PM removal efficiency.

In this study, 2-2 type magnetoelectric (ME) membrane filters composed of the piezoelectric nanofiber layer of poly(vinylidene fluoride) (PVDF) and the magnetostrictive microfiber layer of porous nickel (Ni) to improve ME effect of 2-2 type membrane filters on removal of PM. The surface charge on the nanofibers was induced by applying DC magnetic field, and PM could be captured onto the nanofibers. As a result, 2-2 type PVDF/Ni ME membrane filters were found to exhibit the PM removal efficiency of 90% with DC magnetic field, while less than 50% without DC magnetic field.

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