

## ABSTRACT

In this study, nanofiber membranes were made from recycled nylon and combined with nanoparticle composites and photocatalysts. The research was divided into several stages, namely synthesizing photocatalysts using the sol-gel method, making nylon and nylon-composite nanofiber membranes using the electrospinning method, and characterizing the membranes including: FTIR, XRD, SEM-EDX, flux and porosity tests, and testing the effectiveness of the membrane on pyrethroid filtration using GC (Gas Chromatography) and FTIR. Nylon nanofiber membranes have a smaller average fiber diameter than nanofiber membranes with composites. XRD testing showed that the crystallinity of the nylon nanofiber membrane decreased due to the addition of photocatalysts. The combination of composites in nylon increased porosity and water flux. The flux value for pyrethroid filtration on nylon nanofiber membranes was smaller than that of nylon-composite nanofiber membranes. The rejection coefficient for pyrethroids from nylon nanofiber membranes was greater than that of nylon-composite nanofiber membranes. Based on the FTIR test of the nanofiber membrane after filtration, there are still pyrethroid compounds in the nylon nanofiber membrane while there are no pyrethroids in the nylon-composite membrane.

Keywords: nanofiber, electrospinning, and pyrethroid