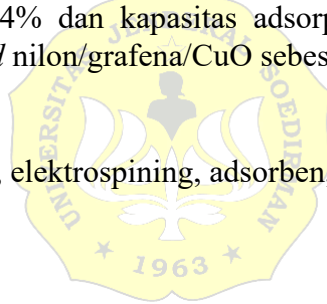


ABSTRAK

Sampah laut jaring ikan berbahan dasar nilon mencemari lautan sebanyak 27% pada setiap tahunnya. Hal ini mendorong untuk dilakukannya pemanfaatan limbah nilon menjadi *recycled* nilon agar bisa didapatkan kembali manfaatnya. Salah satu pemanfaatan tersebut yaitu untuk pembuatan membran *nanofiber* sebagai adsorben gas amonia menggunakan metode elektrospinning. Penelitian ini bertujuan untuk mengetahui proses sintesis membran *nanofiber* elektrospinning, mengetahui karakteristik membran, serta mengetahui efisiensi penghilangan (*removal efficiency*) serta kapasitas membran *nanofiber* komposit berbasis *recycled* nilon yang ditinjau melalui jumlah situs adsorpsi pada membran. Hasil karakterisasi. Membran *nanofiber* komposit berbasis *recycled* nilon menunjukkan serat yang halus tanpa *beads*, dengan diameter $296,70 \pm 39,69$ nm hingga $1224,80 \pm 371,75$ nm. Derajat kristalinitas membran sebesar 47,54% hingga 62,31%. Pengujian sudut kontak menunjukkan bahwa seluruh membran *nanofiber recycled* nilon komposit memiliki sifat hidrofilik. Pengujian porositas menunjukkan bahwa porositas diperoleh pada dengan nilai sebesar $39,56 \pm 1,69\%$ hingga $77,51 \pm 2,26\%$. Persen efisiensi penghilangan tertinggi diperoleh pada membran *nanofiber recycled* nilon/CB/CuO $92,27 \pm 3,54\%$ dan kapasitas adsorpsi tertinggi diperoleh pada membran *nanofiber recycled* nilon/grafena/CuO sebesar 0,0431 mmol/g.

Kata kunci: *recycled*, nilon, elektrospinning, adsorben, amonia



ABSTRACT

Nylon-based fishing net marine debris pollutes the ocean by 27% each year. This encourages the utilization of nylon waste into recycled nylon so that the benefits can be recovered. One of these utilizations is for the manufacture of nanofiber membranes as ammonia gas adsorbents using the electrospinning method. This study aims to determine the synthesis process of electrospinning nanofiber membranes, determine the characteristics of the membrane, and determine the removal efficiency and capacity of recycled nylon-based composite nanofiber membranes viewed through the number of adsorption sites on the membrane. Characterization results. Composite nanofiber membrane based on recycled nylon showed smooth fibers without beads, with a diameter of 296.70 ± 39.69 nm to 1224.80 ± 371.75 nm. The degree of crystallinity of the membrane was obtained from 47.54% to 62.31%. Contact angle testing shows that the entire composite recycled nylon nanofiber membrane has hydrophilic properties. Porosity testing shows that the highest porosity is obtained with a value of $39.56 \pm 1.69\%$ to $77.51 \pm 2.26\%$. The highest percent removal efficiency was obtained in the $92.27 \pm 3.54\%$ from recycled nylon/CB/CuO nanofiber membrane and the highest adsorption capacity was obtained in the 0.0431 mmol/g from recycled nylon/graphene/CuO nanofiber membrane.

Keywords: recycled, nylon, electrospinning, adsorbent, ammonia

