Graphene Oxide Nanoribbon/Functionalized Carbon Nanotube bilayer membrane for textile waste-water treatment

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Nanofiltration membrane for textile wastewater treatment under harsh condition has long been an environmental interest. By compositions of textile wastewater with inorganic salts and organic dyes membrane with high selectivity between salts and dye was required which was challenging. Herein, stable, and high salt/dye selective bilayer membrane with graphene oxide nanoribbon (GONR) and functionalized carbon nanotube (FCNT) membrane is reported. Due to stabile FCNT gutter layer, the bilayer membrane shows stable operation under hydraulic pressure up to 30 bar while retaining high dye rejection (~100%) and high flux of 470 LMH by GONR selective layer. In addition, GONR/FCNT bilayer membrane shows low rejection of inorganic salt (<6%) and high organic dye rejection (~100%) resulting high dye/salt separation factor of 950 under high pressure, cross-flow, long-term filtration.