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ABSTRACT

Mesoporous polymers derived from supramolecules of phenolic resins (PRs) and block copolymers (BCPs) containing highly uniform pores with sizes down to a few nanometers, are expected to deliver promising membrane separation performances. Here we report on the preparation of mesoporous phenolic membranes exhibiting tight ultrafiltration properties through a pore-filling strategy. Solutions of PR/BCP supramolecules are filled into the macropores of polyvinylidene fluoride (PVDF) microfiltration membranes (substrates), followed by thermopolymerization to solidify the solution in the pores. Subsequently, the filled PVDF substrates are treated in hot H_2SO_4 to remove the BCP components, thus producing mesopores in the PR framework. The produced composite membranes are mechanical robust and ductile as