

## Carbon monoxide selective mixed matrix membrane containing silver salt-MgO nanosheet through facilitated transport

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Carbon monoxide (CO) is a byproduct from industrial plants and its separation is necessary. Here, we report a solid-state facilitated transport of CO through silver salt-MgO nanosheet (MgO-NS)-comb copolymer based mixed matrix membrane (MMM). The comb copolymer was synthesized via free radical polymerization of poly(ethylene glycol) behenyl ether methacrylate (PEGBEM) and methacrylic acid (MA). PEGBEM improves mechanical stability of composite membrane and carboxylic acid group of MA minimizes CO<sub>2</sub> permeation. Incorporated silver ions carry CO via  $\pi$ -complexation and presence of MgO-NS enhances activity and stability of silver ions. We found that PEGBEM-PMA membrane with monomer ratio of 7:3 achieved CO/N<sub>2</sub> and CO/CO<sub>2</sub> selectivity of 12.0 and 14.7 respectively, the highest ever reported, while maintaining CO permeance of 79 GPU.