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**Facile fabrication of mixed matrix membranes from simultaneously
polymerized hyperbranched polymer/modified graphene oxide for
MTBE/MeOH separation**

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Abstract: The compatibility and dispensability of inorganic nanofillers within a polymer matrix is crucial for the separation performance of mixed matrix membranes. Using organic compounds to modify the surface of inorganic nanoparticles is commonly used to reduce the agglomeration of nanoparticles and to therefore improve the compatibility between the nanoparticles and the polymer matrix. In this study, graphene oxide (GO) nanosheets were modified by *in-situ* polymerized hyperbranched poly(methylene bisacryl amide amino ethyl piperazine) (HPMA) through electrostatic interactions. The modification of GO and polymerization of HPMA were simultaneously achieved. The HPMA-modified GO nanosheets were then used to fabricate separation membranes on ceramic tubular substrates via a vacuum-assisted assembly method. The chemical structure of HPMA molecules and the HPMA-modified GO nanosheets were confirmed by FT-IR, Raman, and ¹H-NMR spectroscopy. Raman mapping verified that the GO nanosheets were dispersed well in the polymer matrix. The HPMA-GO

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