



Wolfson Department of Chemical Engineering Seminar

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Fabrication of thin film composite membranes for CO₂ separation via interfacial polymerization

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MSc Seminar

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Carbon capture and storage (CCS) has attracted more and more attention due to the climate change and membrane separation is one of the most cost-effective technologies for carbon capture. This study is aimed at preparing thin film composite (TFC) membranes for CO₂ separation via interfacial polymerization (IP) between trimesoyl chloride (TMC) in hexane and diethylene glycol bis(3-aminopropyl) ether (DGBAmE) in aqueous phase. Commercial polysulfone (PSf) membranes, pre-treated with 95vol% EtOH solution, were used as support, which were coated with amino-functionalized cross-linked polydimethylsiloxane (PDMS) inter-layer before IP. Since the selectivity of the resulting membrane still had large room for improvement, effort was also devoted to enhancing the selectivity of the membrane via heat treatment to make the selective layer denser or reusing the unreacted monomers to increase the thickness of the generated IP film (modified IP process). Finally, it was found that the fabricated membranes showed competitive selectivity, but the permeability of the support material directly limited the membrane performance.