# Process synthesis of membranes for $CO_2$ capture

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The problem of $CO_2$ emissions is of current interest due to global concerns about the environmental impacts which high levels of $CO_2$ can cause. In this study we consider the capture of $CO_2$ using hollow fiber membranes and we consider their capabilities and the costs involved in separating $CO_2$ from boiler flue gases obtained from a typical power plant. For this purpose we construct single membrane multi-component models based on existing dynamic and steady-state models. These are combined in a superstructure of different membrane combinations which are solved to predict their overall performance for the removal and purification of $CO_2$. Optimization is applied to obtain the membrane configuration and parameters giving the most cost effective removal of $CO_2$.

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