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PMSE 000 – Novel polymers of intrinsic microporosity for membrane gas separation

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This presentation will introduce the design and synthesis of structurally new monomers and their polymerization to form rigid ladder polymers, resulting in polymers of intrinsic microporosity (PIM) having high molecular weights. The structures of the PIMs have a strong influence on gas permeability. Gas permeability and selectivity can be tuned by the size of the pendant substituent and the spacing between contorted centers in the chain, because of changes in the polymer chain packing or *d*-spacing. The new PIM series were more selective to all gases/nitrogen compared with PIM-1, the most commonly reported PIM structure having high molecular weight.[1] The ladder polymers exhibit higher selectivity coupled with a high permeability that combines to exceed the Robeson upper bound for O_2/N_2.

[1] Budd, P. M. et al. *Adv. Mater.* 2004, 16, 456 – 459.