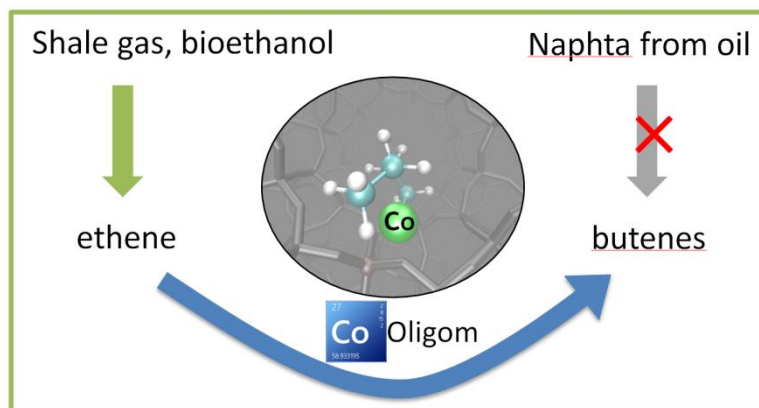




Beyond oil: catalysts for next-generation production of industrial chemicals

Motivation and challenge: As we move from oil towards a more diverse mix of feedstocks for chemical production, there is a need to develop new catalysts that can effectively and selectively convert reactants to products. Butenes were previously obtained by cracking of naphtha from oil, but can also be produced using alternative, more environmentally friendly sources. That is what we aim to achieve with the **COOLigom** project. We aim to develop next-generation heterogeneous catalysts for producing butenes by **selective oligomerization of ethene**, obtained from natural gas or bioethanol.



Objectives and scope The project will use catalysts made from zeolites, aluminosilicates, by introducing metal ions as the active site in the reaction (see figure). Based on current work in the group, COOLigom will move beyond the conventional Ni-based materials and target Co-zeolites. Experimental protocols are already set up from previous work, facilitating project progress and a focus on scientific insight. The project objectives are

- Prepare, characterize and test Co-zeolites in ethene oligomerization up to 30 bars of pressure.
- Compare activity, selectivity and kinetics of the catalysts to Ni-based materials.
- In collaboration with computational work, move towards an atomic-level understanding that will accelerate discovery of improved catalysts.

Skills to be developed

- Catalytic testing and kinetic measurements in a high-pressure chemical reactor.
- Material synthesis: ion-exchange and calcination of aluminosilicates.
- Material characterization: X-ray diffraction, SEM/TEM, ICP.

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