Process development at BASF using Homogeneous Catalysis: Sodium Acrylate from Ethylene and CO_2

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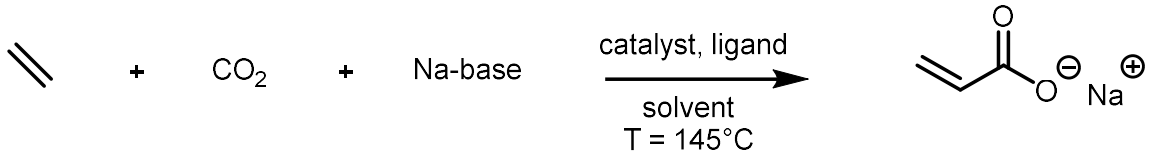
Homogeneous catalysis research at BASF is characterized by a focus on organometallic chemistry closely coupled with process engineering. The strength of this approach will be demonstrated using the process development for synthesizing sodium acrylate from CO_2 and (Bio)-Ethylene.



Initial work to establish a nickel or palladium based catalytic system for this reaction was carried out at our joint postdoc laboratory with the University of Heidelberg (CaRLa). (1) To further develop the reaction towards an economical technical process, optimizing the sodium base and the reaction solvent were found to be critical regarding reactor size, effective catalyst recycling and efficient sodium base regeneration. (2) Energy consumption, product carbon footprint and CO2 abatement costs were calculated and compared to the established route to sodium acrylate based on propylene. An overview of these comparisons will also be presented.

References

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