

# Can We Transport CO<sub>2</sub> Safely?

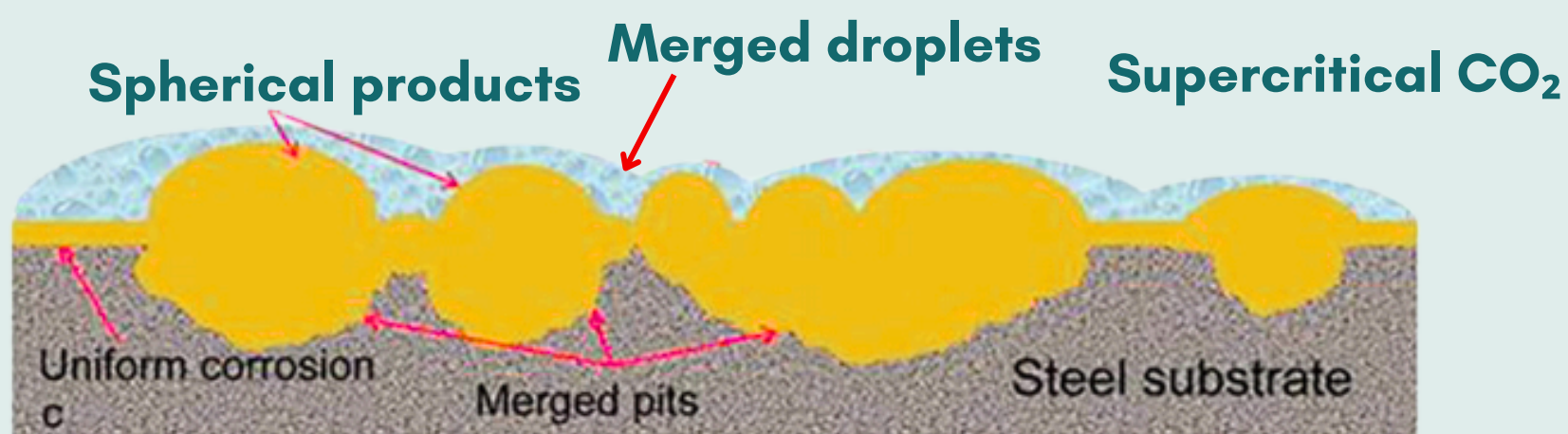
## Amine Carry over and Impurity-Induced Corrosion in CCS Pipelines

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### Background

Carbon Capture and Storage (CCS) reduces industrial CO<sub>2</sub> emissions, but impurities like **amines, H<sub>2</sub>O, NO<sub>x</sub>, SO<sub>x</sub>, and H<sub>2</sub>S** in CO<sub>2</sub> streams can cause serious corrosion challenges during transport.



### Objectives

- Evaluate the effect of amine carryover on steel corrosion
- Investigation of localised corrosion using confocal microscopy and contrast with general corrosion
- Determine the evolution of general corrosion as a function of amine type and concentration

### Expected Results

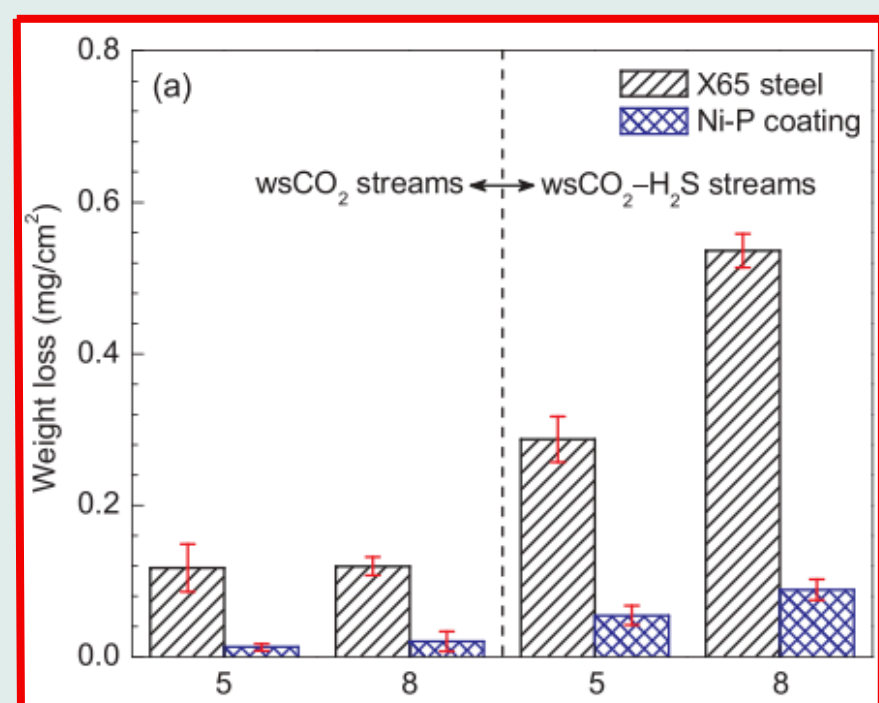


Figure 1: The illustration of expected corrosion behavior under impurity-enhanced scCO<sub>2</sub> conditions (Sun et al. (2019))

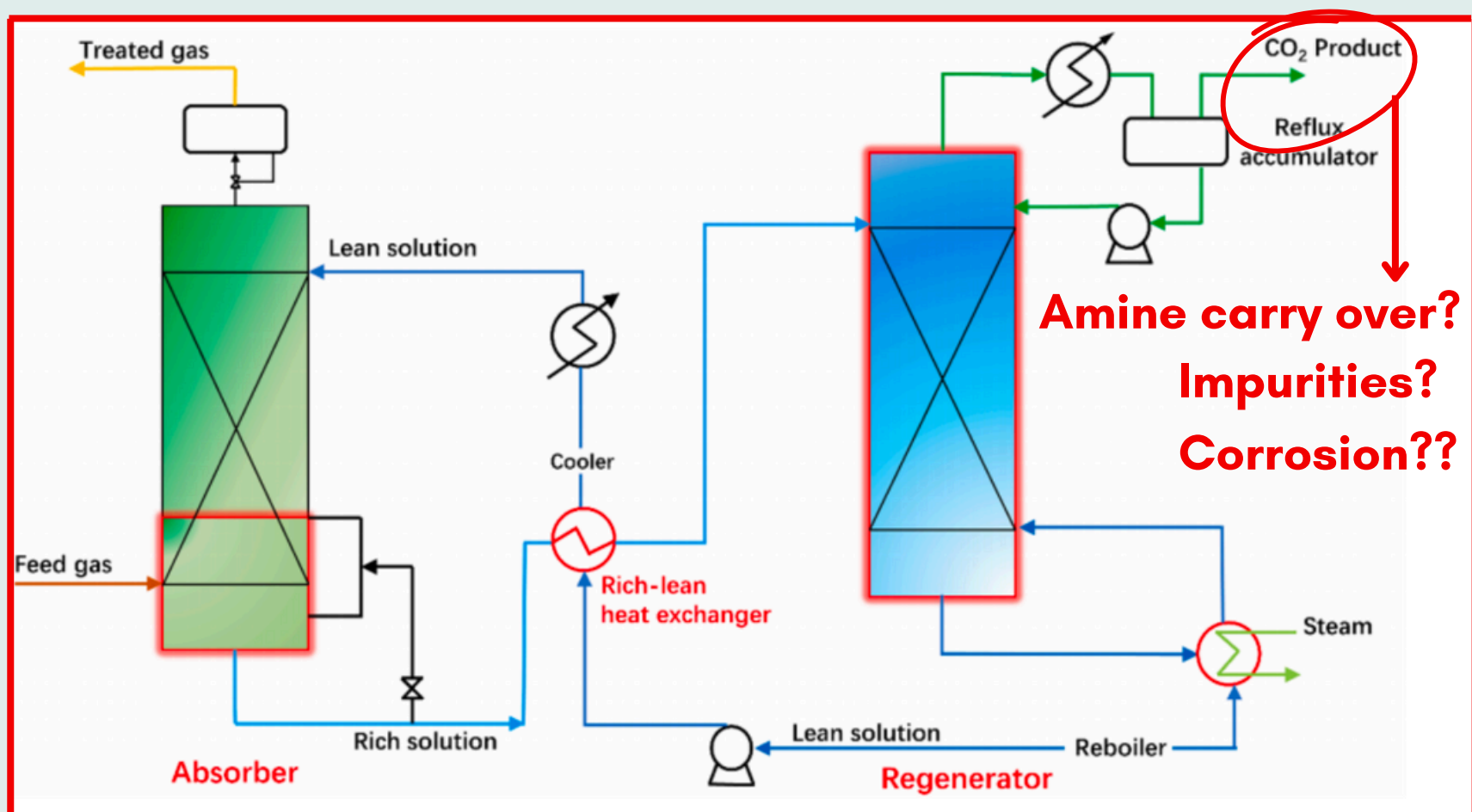


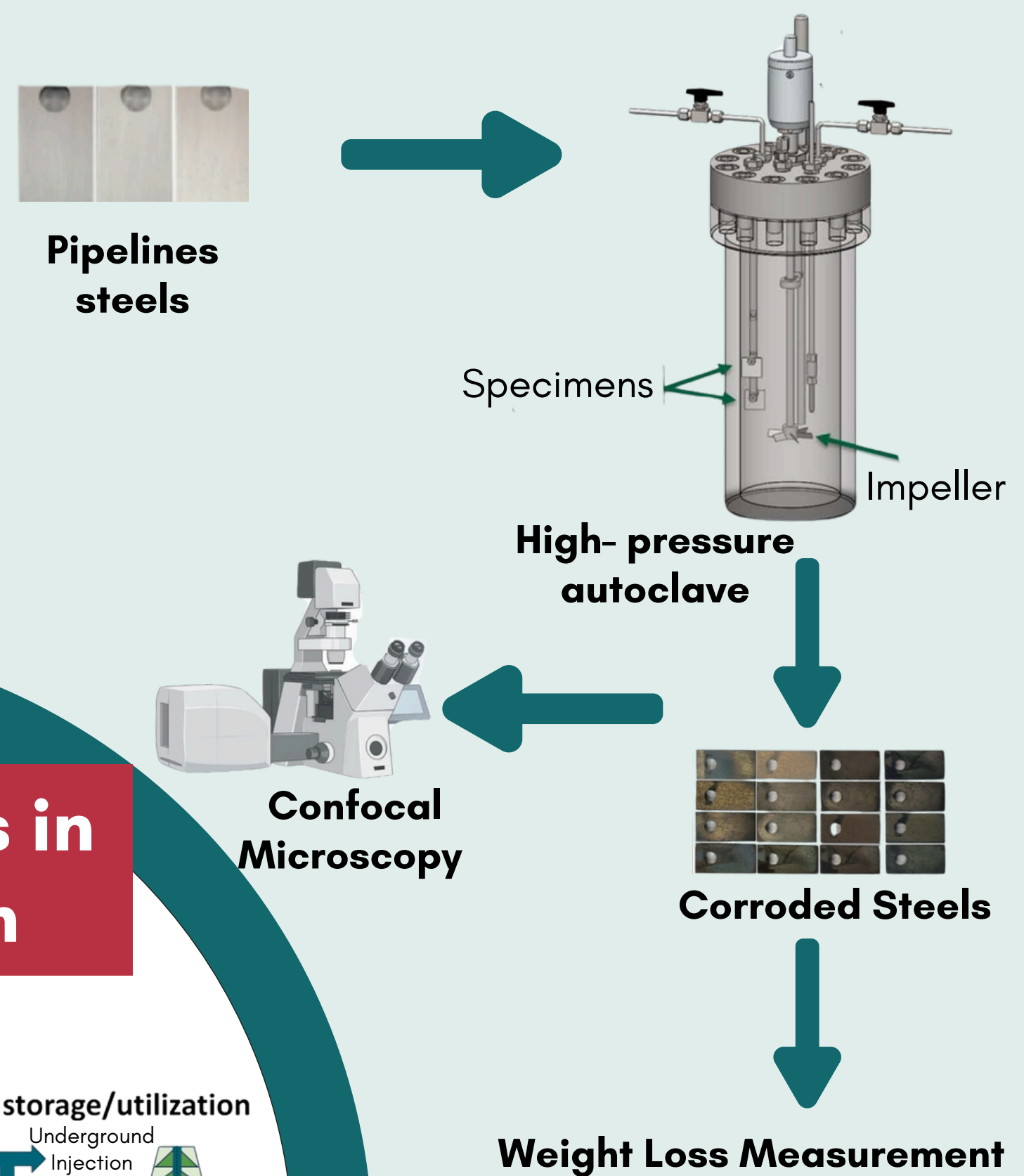
Figure 2: Schematic Representation of the Amine Capture Process

### Acknowledgements

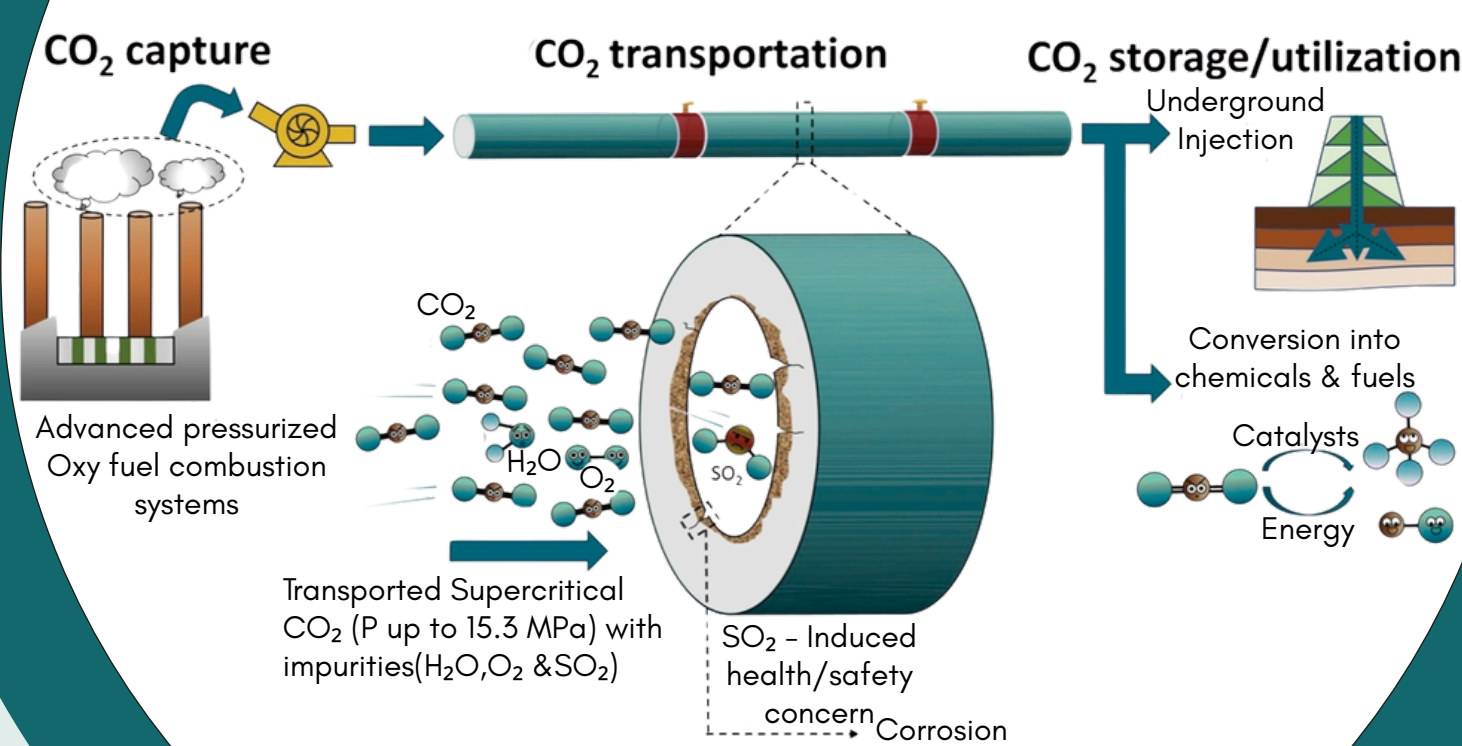
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### Expected Methodology



### CCS Challenges in Transportation



### Conclusions

- Even trace levels of impurities can initiate corrosion under Sc-CO<sub>2</sub> conditions
- Mitigating impurity-induced corrosion is crucial for safe CCS deployment
- Future work includes experimental testing, impurity limit definition, and standardization

### References



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