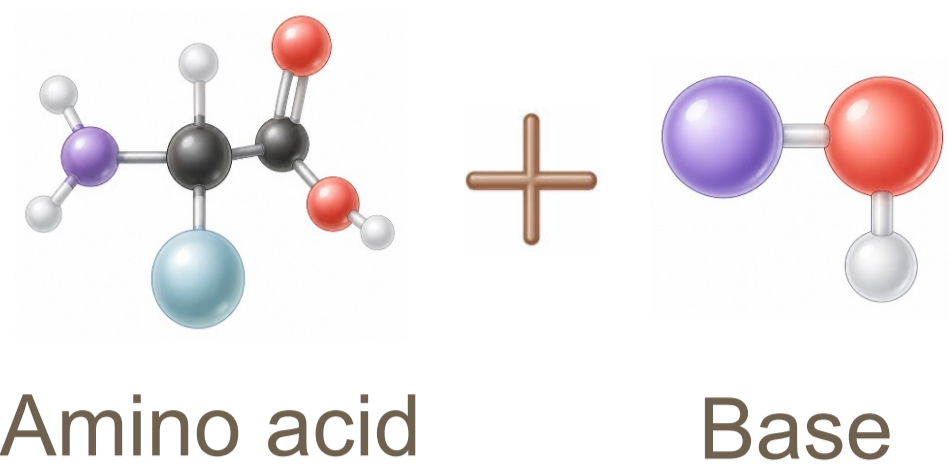




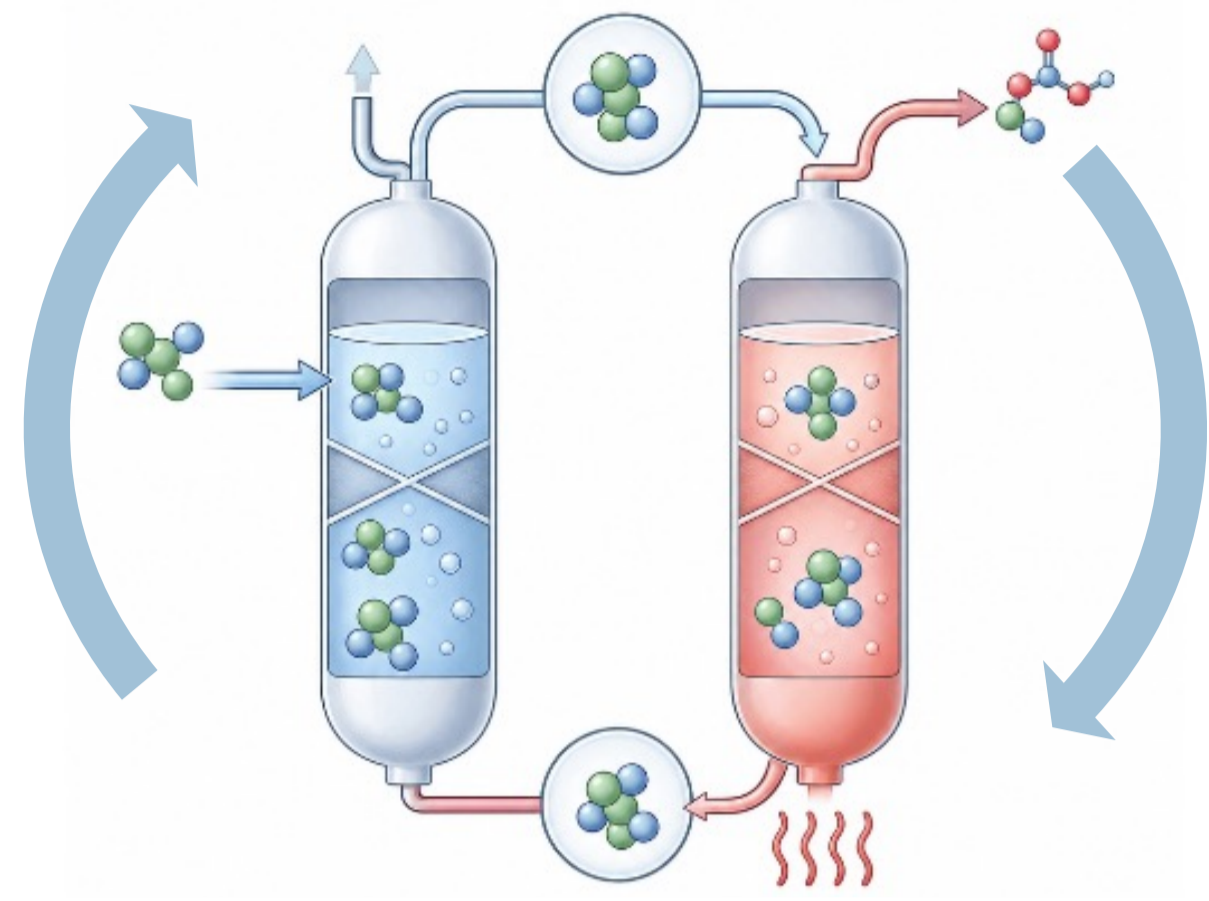
## What? Where? Why? How?

### Amino acid salt (AAS)

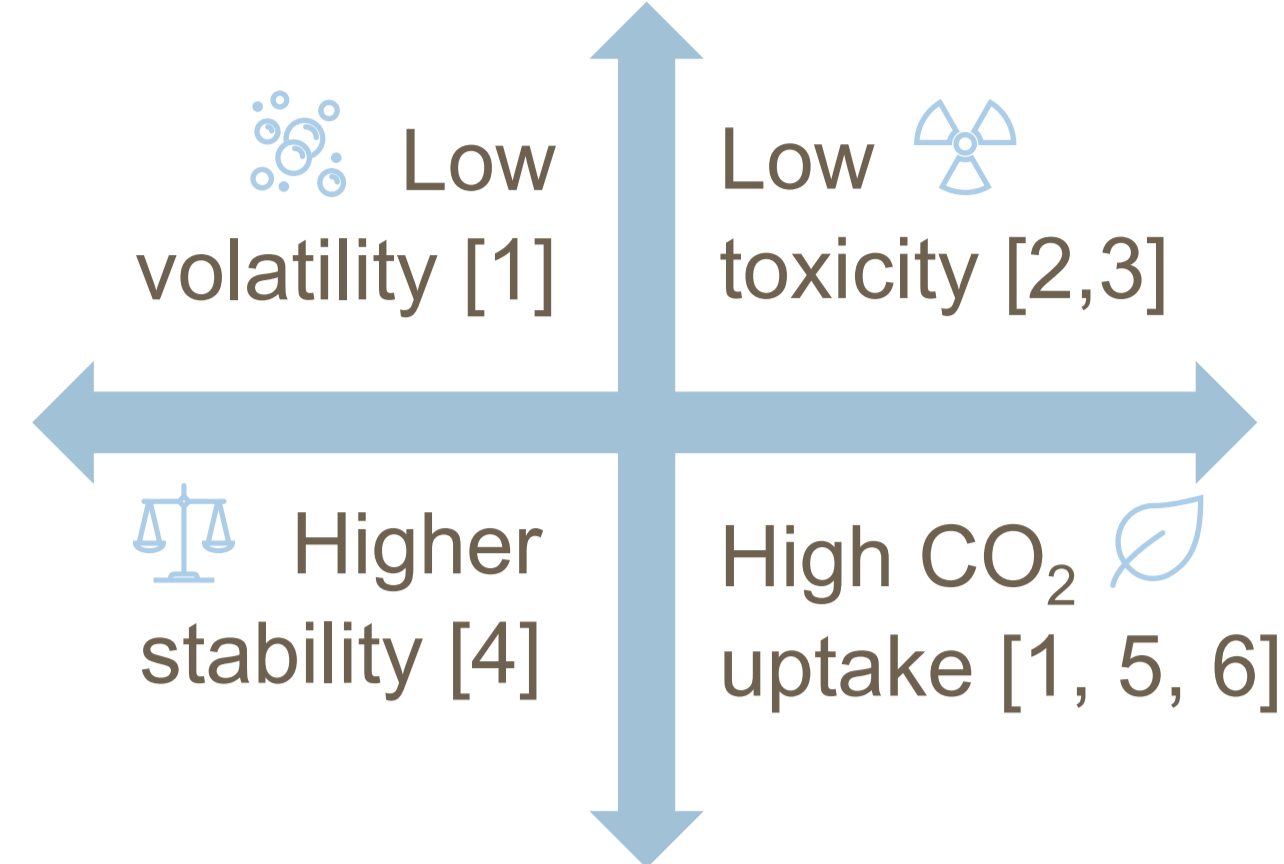


- Potassium glycinate – KGly
- Potassium sarcosinate – KSar
- Sodium lysinate – NaLys

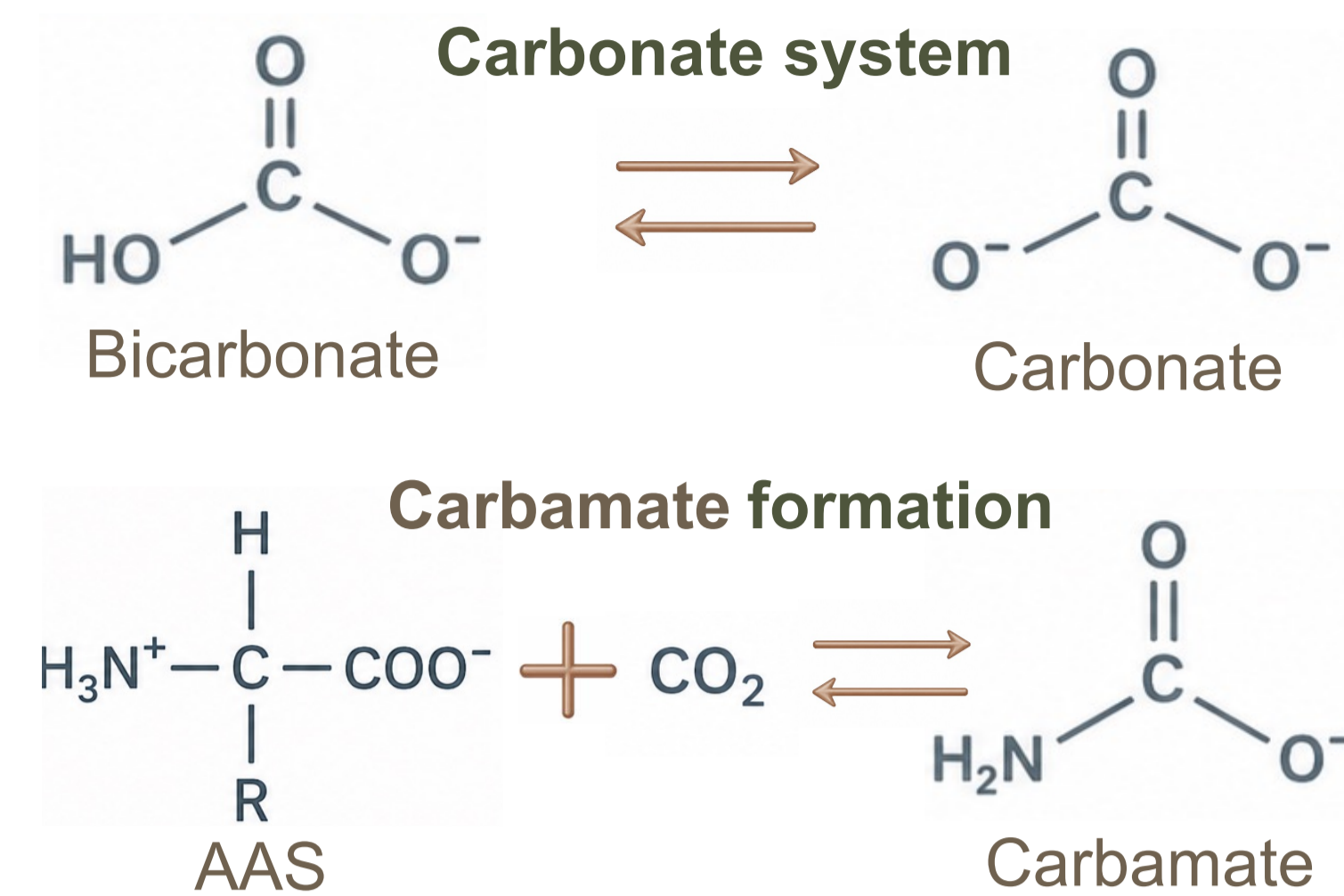
### Regenerative solvent for post-combustion carbon capture



### Promising alternative to primary amines



### Key reactions



## Challenges and opportunities



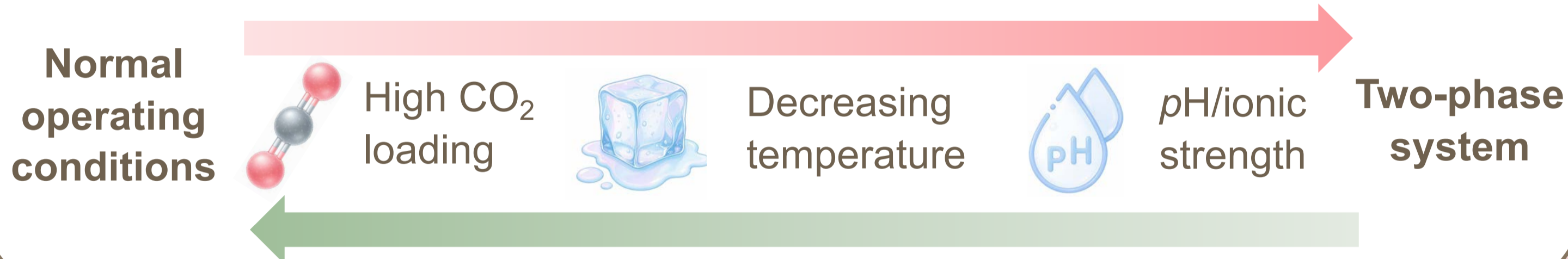
So if AASs are better then why aren't they being used in industry?



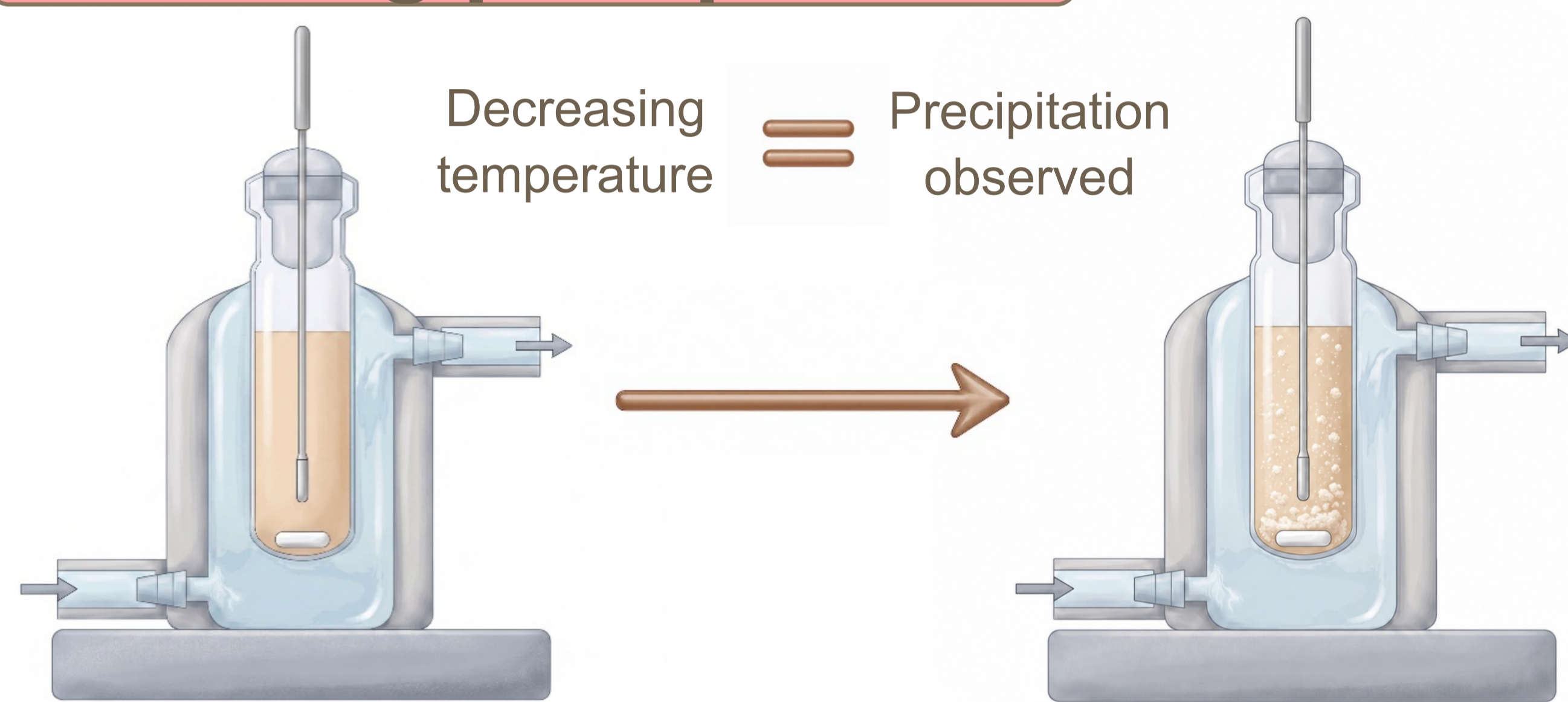
Lack of reliable thermodynamic data.

- |  |             |
|--|-------------|
| <b>CO<sub>2</sub> uptake:</b> How much CO <sub>2</sub> can the AAS hold? | Performance |
| <b>Reaction kinetics:</b> How fast does the CO <sub>2</sub> react?       |             |
| <b>Density:</b> How does the AAS behave?                                 | Operability |
| <b>Viscosity:</b> Will the AAS flow well?                                |             |
| <b>Solubility:</b> Does the AAS remain stable?                           |             |

Solubility is the greatest limitation to scalability [4-6]



## Catching precipitation



### How to determine solubility?

**Ice** Utilised freezing point depression (FPD) method outlined by Fosbøl et al. [11, 12]

**Other solids** Record the temperature the last crystal dissolves (plans to automate this process)

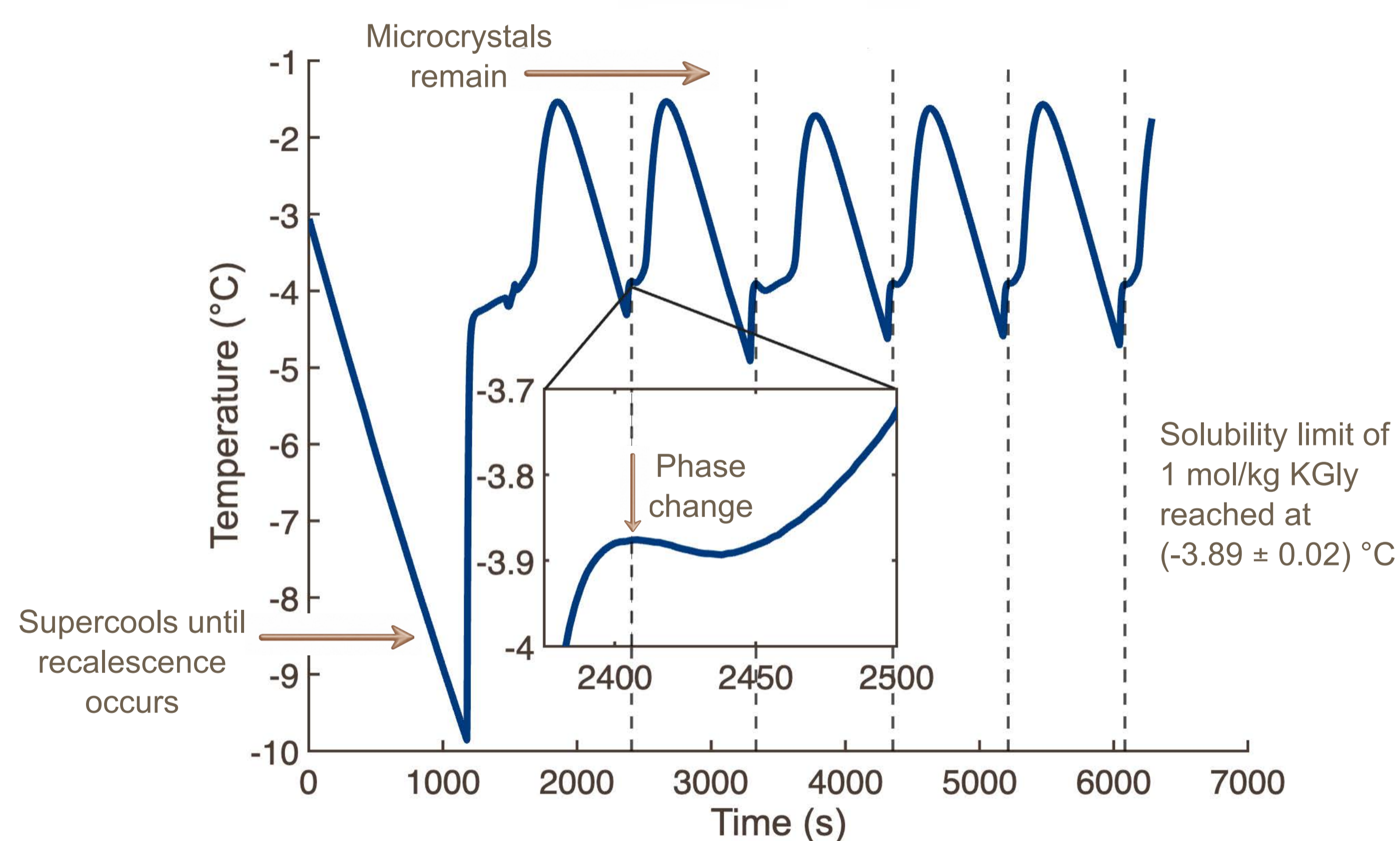


Figure 3: FPD results for 1 mol/kg KGly measured in the above apparatus

## Knowledge gaps – solubility

### VLE – What temp does gas bubble out of solution?

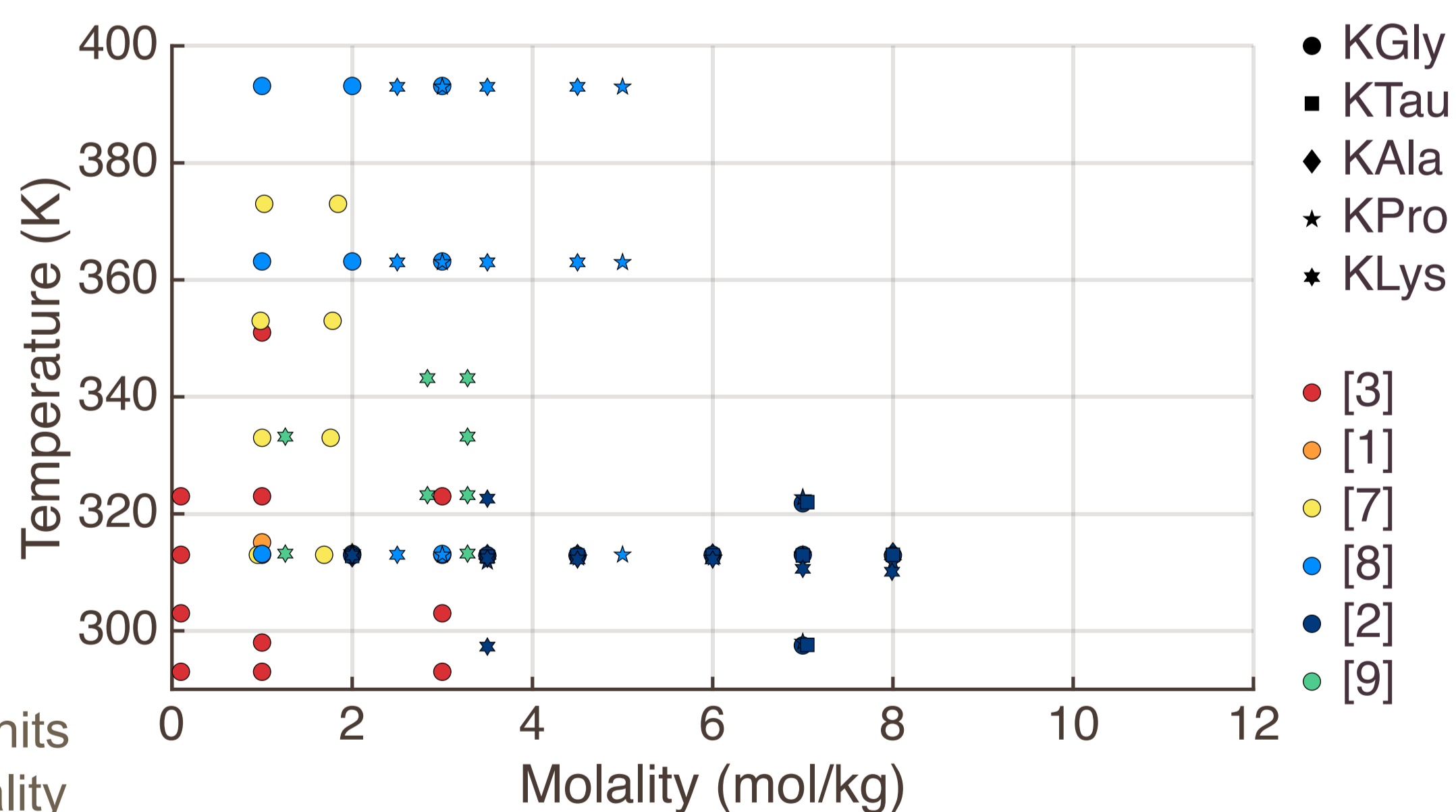
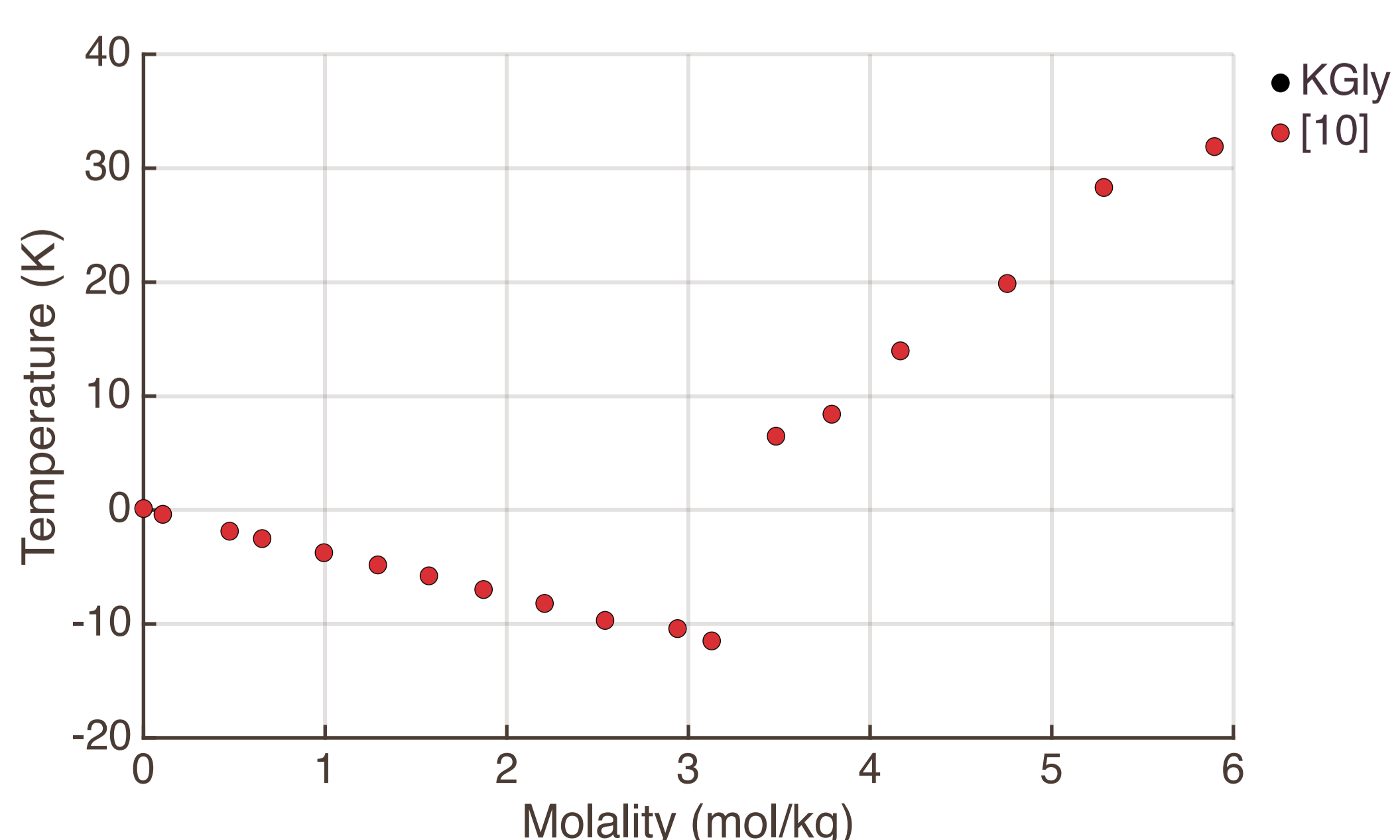


Figure 1: Available vapour-liquid-equilibrium (VLE) studies on potassium AAS-CO<sub>2</sub> systems

### SLE – What temp do solids precipitate out of solution?



- Only 1 study
- Huge potential!

Figure 2: Available solid-liquid-equilibrium (SLE) studies on potassium AAS-CO<sub>2</sub> systems

## Insights and next steps

