



## PB10

### Bio-inspired ionic liquids for reversible CO<sub>2</sub> capture

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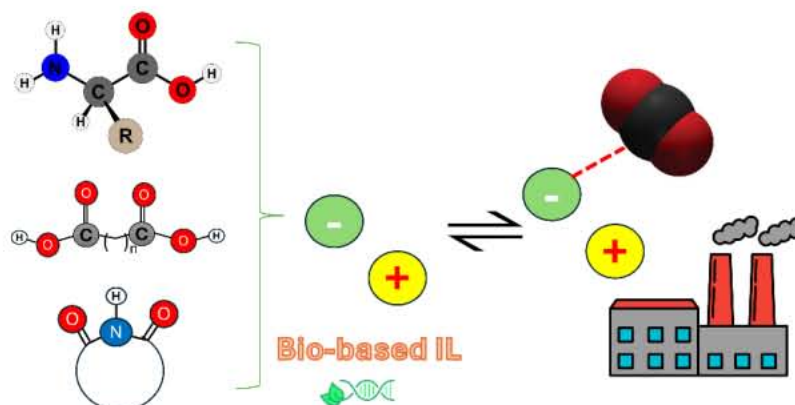
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The atmospheric concentration of carbon dioxide (CO<sub>2</sub>) has increased rapidly over the last decades. This is primarily due to our reliance on fossil fuels for energy production, transportation and industrial processes. There is a significance research in the purification of post combustion gases, as well as the storage and conversion of CO<sub>2</sub> into useful chemicals with a view to mitigating CO<sub>2</sub> emissions. The most widely applied technology for CO<sub>2</sub> absorption is the amine scrubbing process due to its high CO<sub>2</sub> absorption capacity and selectivity. However, the regeneration of amines requires a significant energy input and is characterized by excessive volatility. Ionic liquids are a promising option for absorbers given their negligible vapor pressure and the ability to adjust their chemical properties to enhance their CO<sub>2</sub> affinity [1].

Amino acid-based ionic liquids (AAILs) have the potential to be used for efficient, biocompatible and non-toxic efficient CO<sub>2</sub> capture, while also demonstrating lower energy-intensive CO<sub>2</sub> release properties (Scheme 1). Ionic liquids containing dicarboxylate and amide anions of natural origin could also be employed as potential absorbers. They demonstrate minimal loss in CO<sub>2</sub> capture capacity indicating good recyclability. [2] Consequently, ionic liquids comprising of amino acids, dicarboxylic acids and amides were synthesized. Their structure was verified using ATR-FTIR spectroscopy while their thermal properties were investigated through TGA and DSC techniques. Finally, their CO<sub>2</sub> absorption capacity was determined using isothermal thermogravimetric method using a 1:1 CO<sub>2</sub>/N<sub>2</sub> stream.



**Scheme 1.** Amino acid-based ionic liquids for reversible CO<sub>2</sub> capture from flue gas.

#### Acknowledgements

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#### References

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