

EES Catalysis



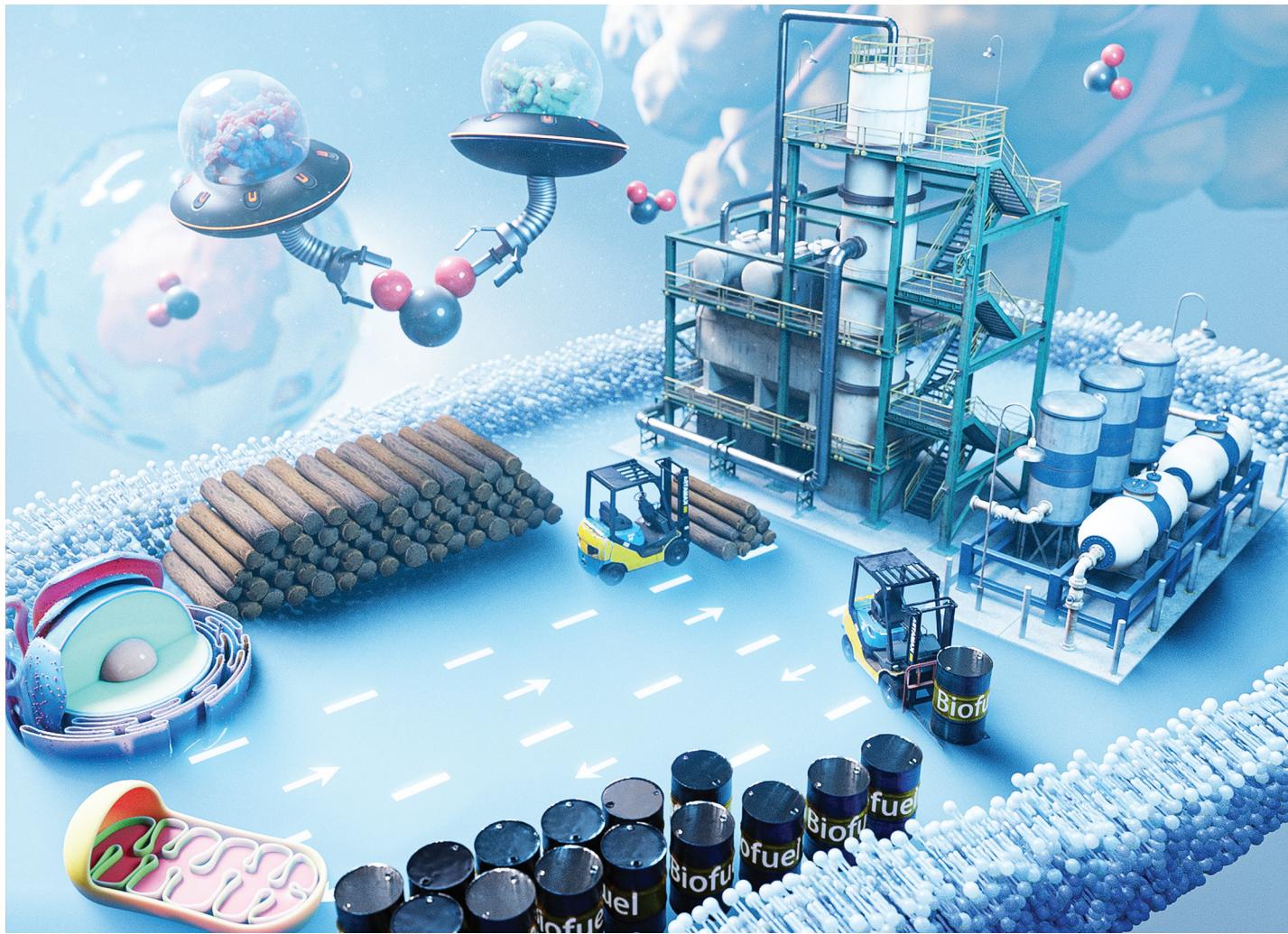
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Fundamental questions
Elemental answers



Showcasing research from Professor Wenjie Yuan's laboratory,
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Liaoning, PR China.

The synergistic effect of formate dehydrogenase and carbonic anhydrase accelerates the ethanol fermentation process and improves carbon recovery

Our study introduces a carbon-negative bioethanol fermentation process by integrating formate dehydrogenase (FDH) and carbonic anhydrase (CA) to convert CO_2 into formate *in situ*. This innovative approach significantly enhanced process efficiency, increasing the glucose fermentation rate and formate production. Notably, it reduced the CO_2 -to-ethanol ratio while maintaining electron transport chain integrity and energy conversion efficiency. The dual benefits of improved carbon fixation and mitigated formate toxicity demonstrate the potential of this strategy for sustainable biofuel production.

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As featured in:



See Cong Du, Wenjie Yuan *et al.*,
Green Chem., 2025, **27**, 6776.