

DynaBioCat (Dynamic Bio-Catalytic Reactor) : a breakthrough technology for CO₂ hydration

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stability,

lower bicarbonates accumulation, to treat charged liquid, or to perform carbonatation by precipitation.

=> Shear stress conditions leading to smaller bubbles of gas and higher gas holdup in the reactor.

Mass transfer intensification



Calculated k_{la} values using Q₁ 50 ml.min⁻¹ and Q_G 50 Nml.min⁻¹. Mean and standard deviation values are determined from at least three independent experiments FFR : fixed foam –bed conventional configuration. EFR: Elastic foam-bed rector

kla EFR > 6 kla FFR.

Which potential of the immobilized CA?

9 cm

2 cm



Foam is used as a support for CA immobilization by entrapment within a hydrogel for better lifetime performances. The non compressed catalytic foam (white) is placed between in the two compressed/relaxed block foams (blue) in continuous operating conditions: Good enzymatic activity for 4 run is observed (similar at first run with free enzyme

Conclusion

- EFR technology effectively enhance the G-L mass transfer with a volume reduction of 1,5 to 4 in comparison to the fixed foam-bed configuration and with a low energy consumption (i.e maximum motor consumption of 35 Watts)
- Entrapment of CA enzyme in a hydrogel gives promising results with flask-scale tests. Optimization of the amount of immobilized enzyme and/or the EFR operating conditions is pivotal for long term usability.

