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Free-conditioning dewatering of sewage sludge through *in situ* propane hydrate formation

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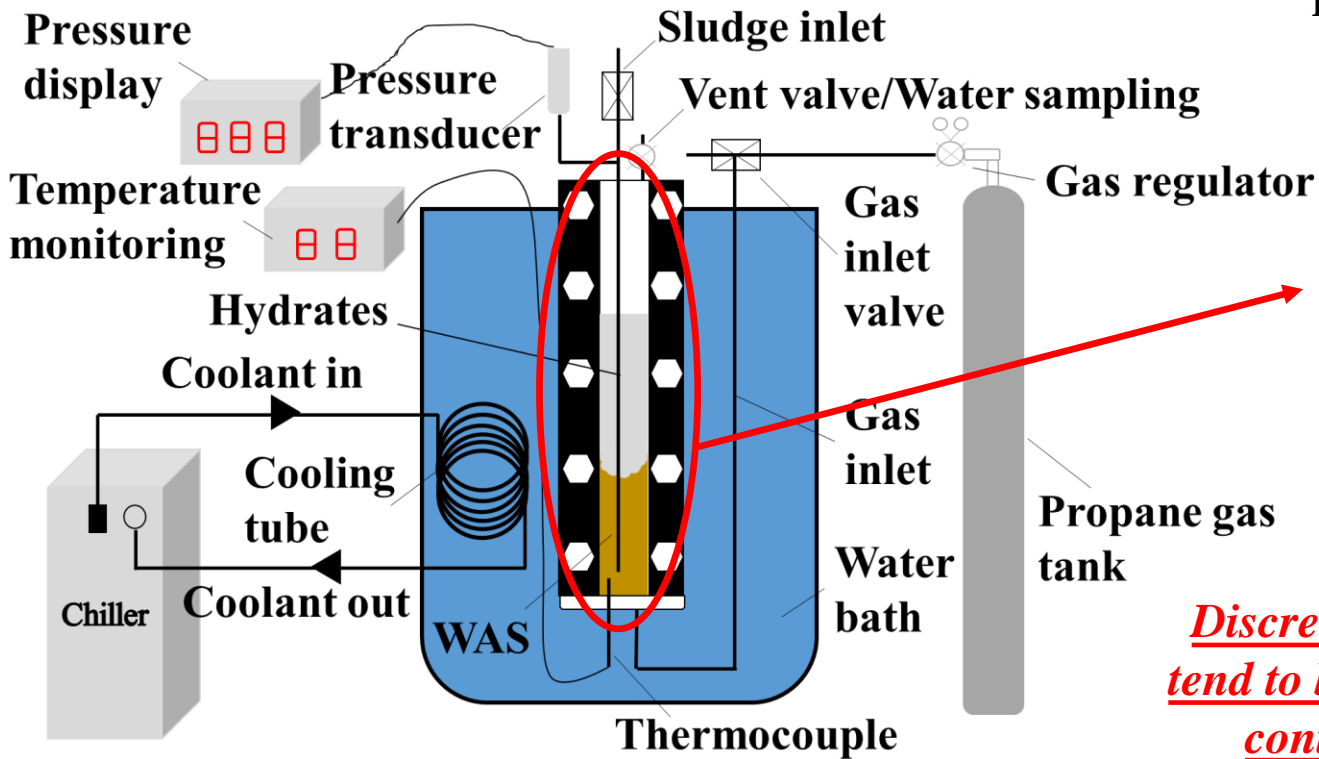
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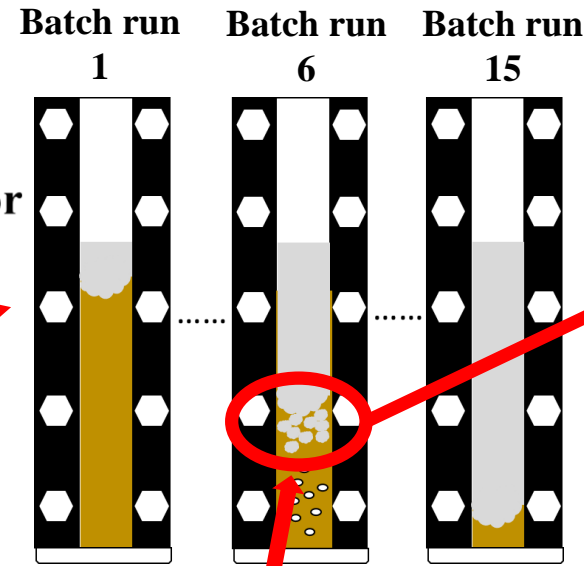
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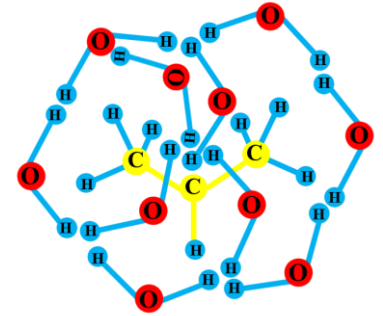


Repeated batch runs during hydrate-based dewatering

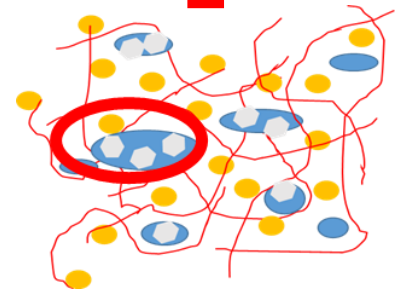


Discrete particles of hydrates gradually tend to be agglomerate and develop into a continuously homogeneous phase excluding sludge particles

Interface reaction for propane hydrate formation



Clathrate hydrates



Bio-sludge flocs

Legend

- Sludge particles
- ⚡ EPS
- Propane hydrates
- Propane gas

Free-conditioning dewatering of sewage sludge with simultaneous clean water extraction through in situ propane hydrate formation

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