Realizing a World without Waste through Catalytic Conversion of Food Waste

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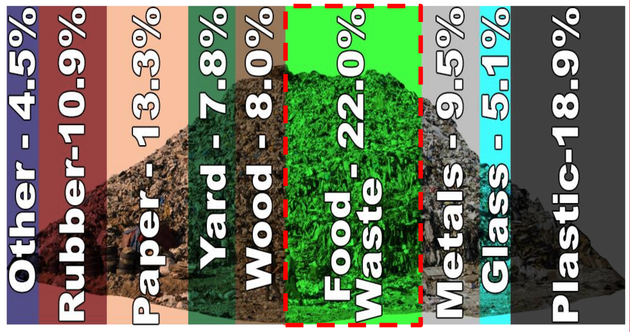
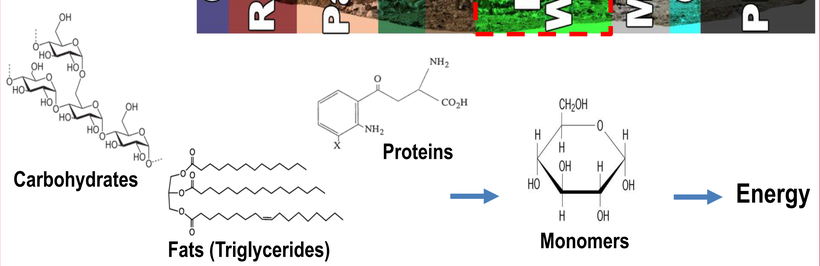
Food Waste Challenges and Opportunities

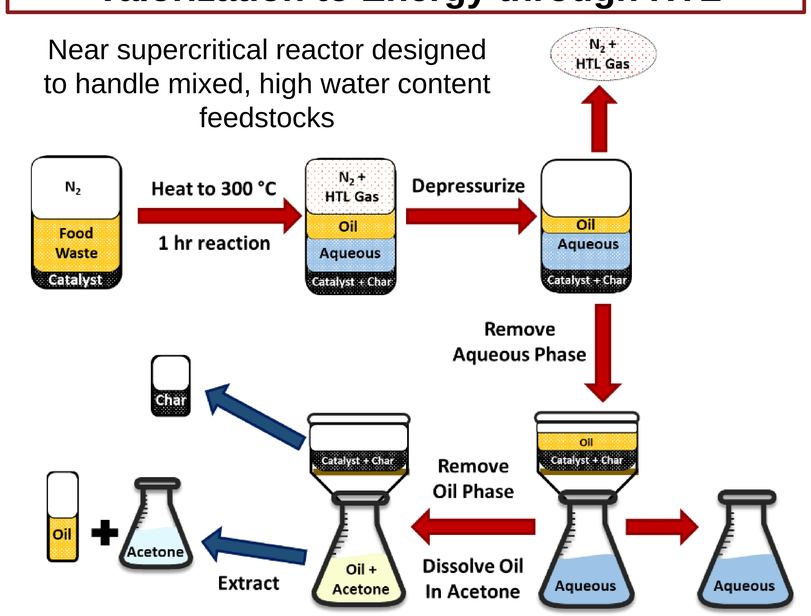
- Wet waste feeds are bottlenecked by energy-intense drying
- Hydrothermal processes are designed for wet feeds



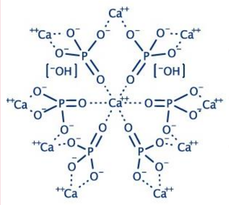


Valorization to Energy through HTL

Near supercritical reactor designed to handle mixed, high water content feedstocks



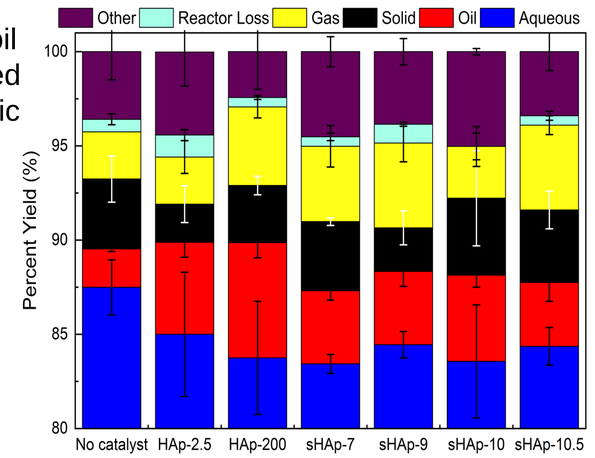
Hydroxyapatite Solid Acid/Base Catalyst



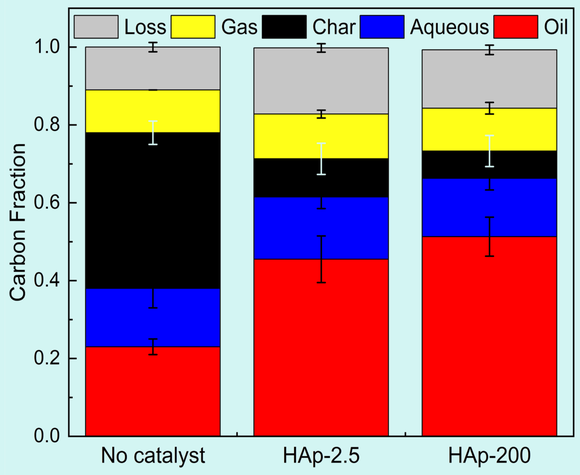
- Tunable acid/ base site ratio
- Moderate cost
- Variable surface area

HAp Results in Increased Oil Yield

HAp **triples** oil yield compared to non-catalytic reactions



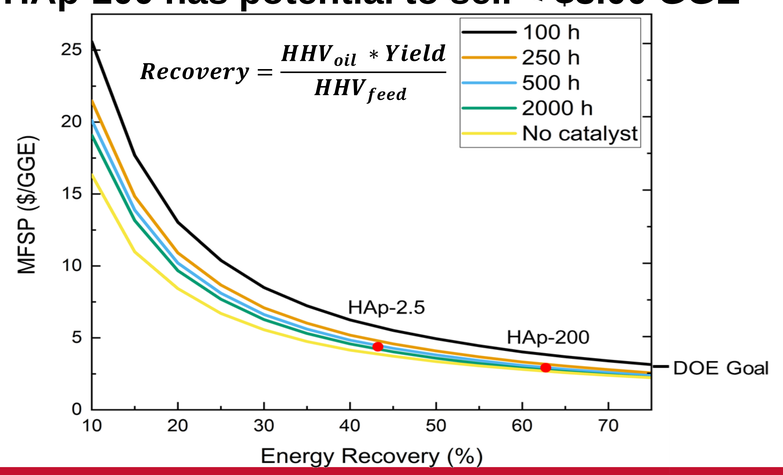
55% of Carbon partitions to the Oil Phase



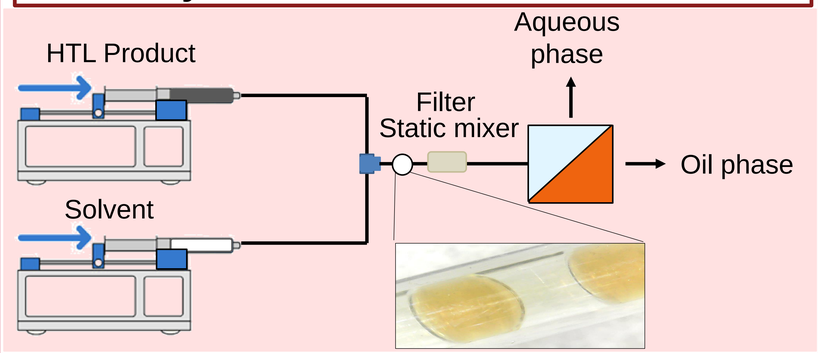
HAp alters reaction kinetics to favor oil phase over char

HAp-200 Achieves > 60% Energy Recovery

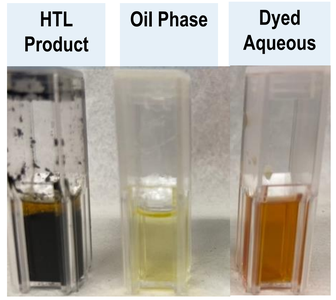
HAp-200 has potential to sell < $3.00 GGE

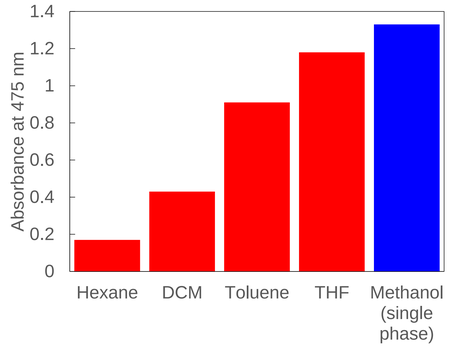


Flow Systems Can Increase Oil Fraction

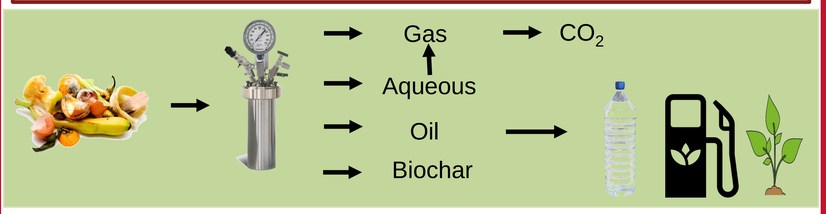


Solubility Affects Separation Efficiency





Conclusions and Future Plans



- HAp is a highly effective catalyst
- Over 60% of stored energy can be recovered

Waste products successfully converted to renewable energy

References

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Acknowledgments

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