

The Future of Carbon Capture Technology

2020 Internship Showcase

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Background Information

- U.S. Department of Energy (DOE) partner
- Scrubbing carbon dioxide out of coal and natural gas power plant emissions
 - Carbon dioxide is a major component of the flue gas mixture (~13% CO₂, 2% O₂, 5% H₂O, 80% N₂).
- The goal is to use a new solvent as an amine solution that removes CO₂ from emissions.



New Solvent Details

- DOE National Energy Technology Lab portfolio
 - New solvent deemed one of the most advanced solvents
 - Potential to reduce parasitic energy penalty—and, therefore, total cost—of carbon capture



Goals to Accomplish During This Internship



Identify reagent suppliers in chemical industry



Identify underlying supply chains for chemical reagents



Identify custom chemical manufacturing businesses

My Contribution



So far, I have



- ☑ Continued industry outreach by contacting chemical toll manufacturing companies (custom chemical manufacturers)

- ☑ Located multiple providers for the limited supply chain of 2-bromoethylether used to create our new solvent

Table 1. Possible Chemical Toll Manufacturing Companies to Create Solvent

Chemical Toll Manufacturing Companies	Capabilities	Location
Capital Resin	Highlights confidentiality, one-plate distillation using vacuum and atmospheric pressures	Columbus, OH (480 mi)
TMC Industries	Custom molecular distillation services, one-step preparation	Waconia, MN (~1,000 mi)
Royal Chemical	Distillation, purification, blending	Chattanooga, TN (470 mi)
InChem Corporation	Purchasing and sourcing of materials, handles difficult materials, multi-step synthesis, distillation	Rock Hill, SC (191 mi)
Richman Chemical Custom Solutions	Sourcing of hard-to-find chemicals, distillation	Lower Gwynedd, PA (415 mi)

Possible 2-bromoethylether suppliers	Price listed
Sigma-Aldrich	\$58.60/25g \$156/100g
Fisher Scientific	\$447.67/500g
Alfa	Not listed, only bulk pricing, once depleted would not restock
TCI America	\$35/25g \$91/100g \$318/500g
Millipore Sigma	\$151/100g
TCI Belgium and Japan	£28/25g £78/100g £254/500g

Table 2. 2-Bromoethylether Suppliers



Key Takeaways

Skills I have learned

- Adaptability
- The business sector of research and development
- Vendor interactions
- Pricing negotiations



“dedicated to improving the human condition ...”

Acknowledgments and Special Thanks



- Dr. Marty Lail
- TAC Team
- BriAnna Walker
- Amy Vargas-Tonsi

Research was supported and funded by U.S. DOE.

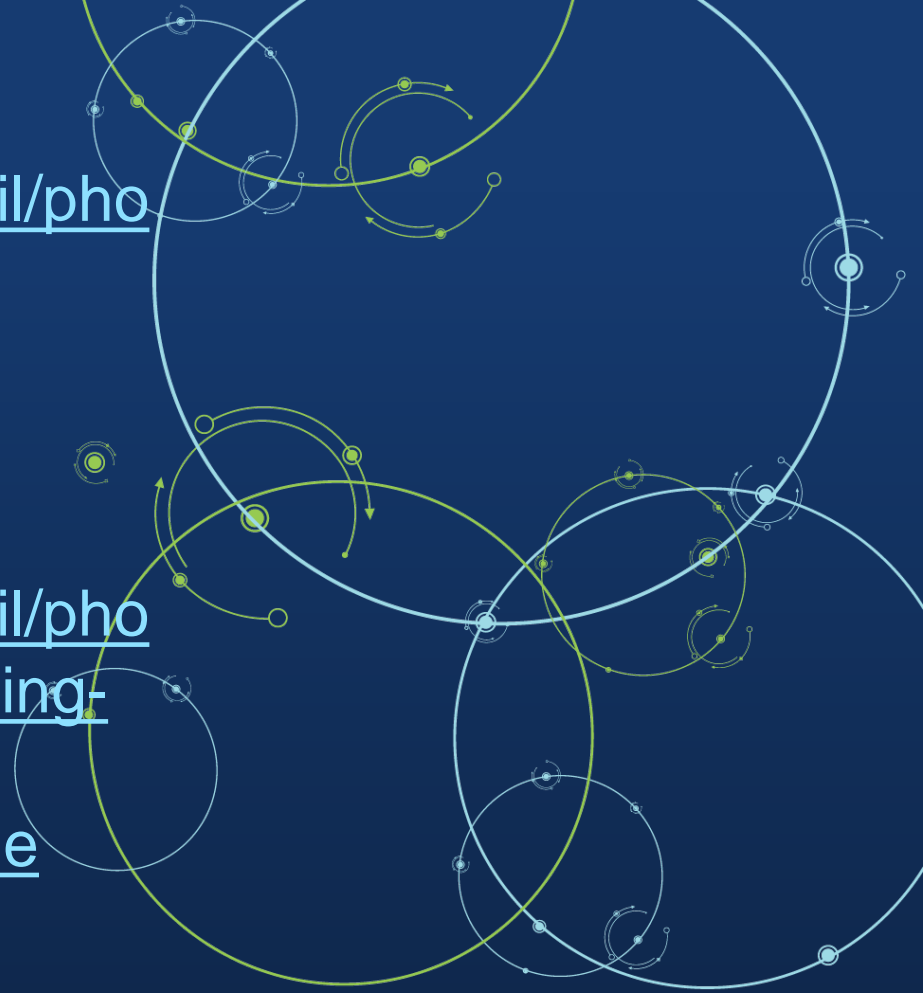
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Thank you

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