

Gas/Liquid Membranes For Natural Gas Upgrading

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ABSTRACT

Efforts this quarter have concentrated on legal agreements, including alternative field sites. Preliminary design of the bench-scale equipment continues.

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INTRODUCTION

Gas Technology Institute (GTI) is conducting this research program whose objective is to develop gas/liquid membranes for natural gas upgrading to assist DOE in achieving their goal of developing novel methods of upgrading low quality natural gas to meet pipeline specifications.

Kværner Process Systems (KPS) and W. L. Gore & Associates (GORE) gas/liquid membrane contactors are based on expanded polytetrafluoroethylene (ePTFE) membranes acting as the contacting barrier between the contaminated gas stream and the absorbing liquid. These resilient membranes provide much greater surface area for transfer than other tower internals, with packing densities five to ten times greater, resulting in equipment 50 – 70% smaller and lower weight for the same treating service.

The scope of the research program is to (1) build and install a laboratory- and a field-scale gas/liquid membrane absorber; (2) operate the units with a low quality natural gas feed stream for sufficient time to verify the simulation model of the contactors and to project membrane life in this severe service; and (3) conducted an economic evaluation, based on the data, to quantify the impact of the technology. Chevron, one of the major producers of natural gas, has offered to host the test at a gas treating plant. KPS will use their position as a recognized leader in the construction of commercial amine plants for building the unit along with GORE providing the membranes. GTI will provide operator and data collection support during lab- and field-testing to assure proper analytical

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procedures are used. Kværner and GTI will perform the final economic evaluation. GTI will provide project management and be responsible for reporting and interactions with DOE on this project.

EXECUTIVE SUMMARY

The cofunding agreement with ChevronTexaco continues under discussion. ChevronTexaco's Chinchaga Gas Plant in Alberta, Canada will not be increasing capacity as planned. Since they do not have a commercial need for the contactor, they have withdrawn that site and are seeking another suitable location. We continue seeking alternative hosts and sites as a backup. A meeting was held with ChevronTexaco in Denver last quarter to identify potential locations. Most of their needs are outside the North American market. They have asked for a test unit design for a West African site. Discussions have begun for a potential application at their Carter Creek Plant in Wyoming. This site handles a high-pressure natural gas stream with 16% H₂S requiring treatment to bring it to 4 ppm.

This quarter, ChevronTexaco identified a potential test site in West Texas. The application here is for a full-scale dehydration unit, similar in size as originally proposed, but for a different natural gas processing application. KPS has begun exploratory design to see if this site would be representative of other gas processing applications for the technology.

A final agreement has been reached between GTI and KPS this quarter that will allow KPS to begin their work scope. As with GTI, the bulk of the work will be delayed until the site is finalized with DOE.

EXPERIMENTAL

No experimentation was performed this quarter.

RESULTS AND DISCUSSION

No results have been achieved at this point.

CONCLUSION

No conclusions have been reached at this point.

REFERENCES

None