

Energy Efficient Natural Gas Dehydration w. Agricultural Residue

Market need

Natural gas dehydration is an essential step prior to gas compression in the pipelines in order to prevent hydrate formation and the concomitant operating problems.

Existing methods require either expensive and environmentally hazardous desiccants, high energy use or complex, unproven processes. The same need exists in the production of bio-gas. Glycol dehydration is the most common and least expensive method for dehydrating natural gas.

Our solution

This invention uses an agricultural waste product to act as a high performance, environmentally friendly, cost effective water vapor adsorbent from natural gas and bio-gas.

It features almost 100% selectivity towards the adsorption of water vapor vs. methane. The adsorbent material can be used in an efficient, low-cost pressure swing absorption process and achieve high quality results with low capital and operating costs, and minimal energy usage compared with temperature swing technology.

This technology would have applications throughout natural gas processing plants as well as biogas and fermentation plants in Canada and the United States.

Benefits to our approach

- Features both a process as well as a novel adsorbent for the dehydration of natural gas
- Novel adsorbent based on agricultural residue – cheap, highly available and can provide a market for farmers
- Comparable operating costs to tetraethyl glycol (TEG) dehydration with less environmental damage and far lower capital costs
- Considerably reduced operating costs compared to temperature swing adsorption with molecular sieves, with lower capital costs
- Easier to implement than emerging technology like supersonic nozzles.
- Improved economics by repurposing an agricultural waste product to efficiently dehydrate raw natural gas or bio-gas
- The adsorbent is stable over many dehydration cycles and shows no loss of capacity or selectivity after 70 dehydration/recharge cycles.

Patent status

US provisional patent filed.

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