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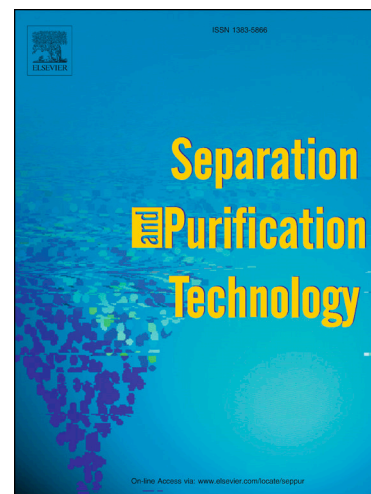
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## Improved Design of Two-stage Filter Cartridges for High Sulfur

### Natural Gas Purification

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#### Abstract

Two-stage filtration units including pre-filtration and coalescence filtration play an important role in the quality control of high-sulfur natural gas, because micron-sized particles can significantly influence the gas sweetening process. Filtration failure usually occurs in operation, because of the mismatch between the two types of filter cartridge in the filtration unit. To overcome this drawback, the performance of the coalescing filter cartridge must be improved and a matching pre-filter cartridge need to be designed. One approach for accomplishing this is to spray an atomizing adhesive onto the fibrous layers of the filter cartridge to enhance its integrated filtration performance. In this study, a pleated protective layer and a hydrophobic drainage layer were designed for the coalescing filter cartridge to prolong the operation cycle and quickly drain the captured liquid. Testing results showed that the new-type of coalescing filter cartridge exhibited 75% decrease in its steady pressure drop over that of the original filter and the filtration efficiency reached 99.99% for liquid droplets with diameter greater than 0.3 micron. The structure of pre-filter cartridge was also redesigned to match the performance of the new coalescing filter cartridge. As a result,

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