



Interoffice Communication

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From R. A. Frohreich

Date April 7, 1976

Subject Carbon Adsorption System for Control of VCM Emissions

On Thursday, April 1, 1976, I attended a session of the Industrial Pollution Conference in Houston. Tenneco presented a paper entitled "The Use of Carbon Adsorption for VCM Emission Control." Their pilot plant work and operation of the commercial unit at the Pasadena, Texas, PVC plant were discussed. Major points covered in the talk are as follows:

1. Feed to the pilot unit ranged from 10 ppm to 100 percent VCM. Space velocities of 10 to 70 feet per minute were investigated. Three different types of carbon were evaluated to determine the effect of bed life on the adsorptive ability of each of the types. Loading and regeneration were carried out for 82 cycles. They found the carbon types with the higher initial loadings lost capacity with repeated cycles but concluded one of the types would be suitable for a commercial unit.
2. The commercial unit was installed in the plant in early 1975 and has been in operation the past twelve months. During this time, the carbon has undergone more than 1,300 adsorption and regeneration cycles.
3. The average VCM level in the adsorber effluent stream has been less than 4 ppm.
4. Ninety-five percent of the readings from the continuous monitor on the adsorber effluent has been less than 10 ppm VCM.
5. After ten months of operation, the carbon had retained 90 percent of its original VCM adsorptive capacity.
6. Physical carbon loss after ten months of operation was 1 percent.

A copy of the paper is attached.

The Tenneco commercial unit was designed and built by Chemical Design, Inc., of Lockport, New York. Tenneco are now licensing their carbon adsorption technology. Chemical Design, who have specialized in the design of package units, would design and build a unit based on the flow rate and VCM concentration of licensees' vent stream. I recommend we consider this route for the design of our carbon bed systems for the PVC plants. The system would be based on a proven design of a commercially operating unit. The Tenneco license fee would be in the \$30,000 to \$45,000 range. We have requested a copy of the Tenneco secrecy agreement and will have Patent and Licensing review it upon receipt.

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Chemical Design have received an order for the design and construction of a carbon adsorption system from one of the PVC producers and are currently working with about ten others.

In a private discussion, a representative of the Union Carbide PVC plant at Texas City, Texas, made the following comments:

1. They do not plan to have a carbon adsorption system at this plant. They have built and are operating a solvent absorption system to clean up the vent streams. The system does not reduce the VCM content to less than 10 ppm. The vent from the adsorption unit is combusted in the plant boiler as the last step of their cleanup process.
2. They are batch stripping their resin and plan to continue to do so. They sent samples to Goodrich for testing in the continuous stripper pilot unit. The resin returned from Goodrich had a caramel color.
3. He said that, if excessive methyl chloride is present during polymerization, the resin viscosity decreases rapidly (reference Table I of the paper showing 845 ppm methyl chloride in the recovered monomer).
4. He also commented they sent EPA about a two-inch thick rebuttal to the proposed standard.



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