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Mr. Don R. Goodwin
Emissions Standards and Engineering
Division
Environmental Protection Agency
Research Triangle Park, North Carolina 27711

Dear Mr. Goodwin:

In a recent letter addressed to you, Dr. D. A. Kuhn discussed Conoco's comments on the proposed amendment to the National Emission Standard for Vinyl Chloride. Another comment has been suggested since that letter was prepared; and in the interest of expediency, Dr. Kuhn has asked me to make that comment directly to you.

The comment pertains to the portion of the amendment that specifies that the VCM content of the vent gas from a new oxychlorination source be controlled at or below 5 ppm.

In the development of the VCM emission standard issued on October 21, 1976, the EPA evaluated incineration, carbon adsorption, and solvent absorption control technology and concluded that those technologies could be used to control VCM emissions to concentrations of 10 ppm. This evaluation was based in part on test work done on a vent gas incinerator burning a mixture of chlorinated hydrocarbons and natural gas and on a solvent absorption unit and a carbon adsorption unit treating VCM containing vent gases from two PVC plants. The incineration test did show control of VCM emissions to 10 ppm. However, the solvent absorption unit was only capable of controlling VCM emissions to 15 ppm. The carbon adsorption test did show control of VCM emissions to 10 ppm, but it also indicated that the VCM adsorption capacity of the carbon bed may decrease by approximately 50 to 60 percent after only 28 cycles.

Although these tests indicated that there was more uncertainty in the selection of carbon adsorption or solvent absorption over incineration for VCM emission control, the EPA concluded that, with up-to-date engineering designs, both carbon adsorption and solvent absorption control technologies could be used to control VCM emissions to 10 ppm.

The VCM standard issued on October 21, 1976, limited the VCM content of the oxychlorination vent to 0.02 pound VCM emitted per 100 pounds of pure EDC produced by oxychlorination. Conoco's VCM plant at Westlake, Louisiana, expects to be able to meet that emission limit through continued optimization of the air-based oxychlorination process without the installation of a separate additive control device.

However, a similar new plant would require an additional vent VCM emission control device to meet the 5 ppm limit in the proposed amendment. Conoco are concerned that a 5 ppm limit may preclude the use of solvent absorption or carbon adsorption as an alternate to incineration for further control of the oxychlorination vent.

This concern is based in part on the results of the EPA's own evaluation tests discussed above. It also recognizes that the oxychlorination vent contains ethyl chloride and other chlorinated hydrocarbons which would normally not be found in the PVC plant vent streams used in the carbon adsorption and solvent absorption tests. Conoco are concerned that this difference in vent gas composition may affect the control efficiency of the carbon adsorption and solvent absorption processes and prevent them from reliably controlling the oxychlorination vent VCM concentration at 5 ppm.

For an air-based oxychlorination process, both solvent absorption and carbon adsorption offer the potential for emission control with a smaller energy (fuel) requirement than vent incineration. Since the vent from an air-based oxychlorination plant contains only 2 percent hydrocarbons, its fuel value is low; and a large quantity of fuel will be required to incinerate that vent. Approximately 96,000 barrels of fuel oil per year would be required to incinerate the oxychlorination vent from a 700 MM pound per year VCM plant having an air-based oxychlorination process.

Also, carbon adsorption and solvent absorption would control other hydrocarbon emissions in the oxychlorination vent similarly to incineration. As you know, carbon adsorption and solvent absorption have the additional advantage of recovering the vent hydrocarbons rather than destroying them as in incineration.

Of course, another alternate to incineration of the vent from an air-based oxychlorination process is to use an oxygen-based oxychlorination process and then incinerate its much smaller vent. As discussed in Dr. Kuhn's letter, Conoco's economic comparison between an oxygen and air-based oxychlorination process designed to meet the October 21, 1976, standard indicates that the two may not become comparable until the oxygen cost is reduced to less than $10 per ton. At the $14.43 per ton suggested price in the EPA evaluation, the oxygen-based process would be less economically attractive. At the $31 per ton price quote received recently by Conoco Chemicals, the difference in the economics of the two processes is even more pronounced. However, when compliance with the restrictive emission limits in the proposed amendment is considered in the process economic comparison, the result will favor oxygen-based oxychlorination. This reversal is caused by the very large capital and operating costs attendant with incin-

eration of the large vent from an air-based oxychlorination process. Since the oxygen-based oxychlorination process is less economically attractive without this vent restriction, conversion to oxygen oxychlorination in new plants will require increased product margins and selling prices over what would be required with air-based oxychlorination. The required increase in product margins may not be attainable, since the new oxygen-based plants will be at a competitive disadvantage with the existing air-based VCM plants.

All but two VCM plants in the United States now use air-based oxychlorination. Obviously, there has been much deployed in the way of development funds and technical and operating manpower to optimize the efficiencies, capacities, safety, and ecological impact of the air-based oxychlorination processes.

If the standard is amended in a way that results in a switch to oxygen-based oxychlorination for new plants, much of the producers' operating background and know-how with air-based oxychlorination will not be applicable to the new oxygen process. The uncertainties of designing and operating a "new" process will result in some operating inefficiencies for a period of years while the producers learn how to best operate the new oxygen oxychlorination processes. Therefore, there would be some benefit to the economy and to the public if the VCM standard did not dictate emission limits so restrictive that producers must abandon air-based oxychlorination technology for new plants.

If the allowable VCM emission in the oxychlorination vent is to be further reduced, Conoco recommend that the vent emission limit be set at a level above 5 ppm which will allow the use of carbon adsorption or solvent absorption control technology. The lower operating and capital costs of these control systems may allow a VCM producer to economically retain air-based oxychlorination in a new plant and still remain competitive.

Yours very truly,

John H. McCulley, Jr.
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bcc: REL, DAK, JADe, GLF, GJF, RGG, RWC, DHS, LDW, JJD