From MONSANTO CHEM. COMPANY

At Texas City, Texas

Date August 4, 1953

To C. T. Murray

Reference Your memo July 30

At Texas City, Texas

Subject Leak Protection Instrument for C_2H_2-HCl Reactors

I have examined the C_2H_2-HCl reactor system with respect to the detection of leakage of HCl from the reactor streams to the cooling system. Two methods of leak detection appear possible. pH will detect an increase in hydrogen ion concentration produced by leakage of HCl and therefore will provide a direct indication of the existence of corrosive conditions. Conductivity would probably work, but would also respond to an increase in ionic content of the condensate which comprizes the cooling stream. A false indication of corrosive conditions is therefore possible although improbable. pH is recommended because it provides direct information regarding the corrosive properties of the water, and as it is probably somewhat more sensitive than conductivity.

We recommend that conventional pH equipment be obtained for this leak detection application. It appears that a 6 point pH recorder, range 2 to 12 pH, with a separate electrode system for each reactor, would be most satisfactory. No experimental work is necessary. By running sample lines from suitable points in the system to the electrodes located at ground level, it will be possible to operate the electrodes at atmospheric pressure, which is highly desirable from a maintenance standpoint.

The sample is stated as being at 80°C, and will require cooling to approximately ambient temperature at the electrodes. If the sample lines are run bare natural cooling may be adequate; if not other means of cooling will be required. The possibility of bare lines freezing in winter should be considered. The spent sample can probably best be discharged to sewer.

As this is an installation of commercially available equipment and is quite similar to other leak detection pH units in the VCM area, procurement and installation can be handled by plant engineering. However, it is recommended that J. F. Davis be consulted in designing the installation so that this may be made in a manner permitting the most convenient electrode maintenance.

This recommendation is forwarded without adequate consideration of optimum sample points, sample line sizes, etc., in order that procurement of this instrumentation may be initiated as soon as possible. These details can be resolved later.

R. F. Wall

CBV 1115809

RFW:dmg

IN 10