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AGRICULTURAL CHEMICALS DIVISION

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December 15, 1976

CHEVRON CHEMICAL CO.  
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Dear Art:

Paraquat : Impurities in Product Produced by the Taiwanese

Analytical work in England has demonstrated that the nature and content of impurities in Taiwanese paraquat dimethyl sulphate differ significantly from those found in ICI material. In particular 2, 2', 6'2" - Terpyridly has been detected in most samples of Taiwanese paraquat at rates up to 300 ppm; this impurity is 200 times more toxic than paraquat and more-over is toxic via skin absorption.

The technical highlights of the case are shown in the two chromatograms which I enclose with this letter. This information is being used to inform our overseas companies and independent distributors about impurities and their possible implications. PPD have decided that the information should be used in the following ways:

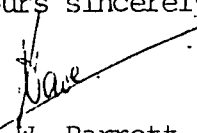
- ✓ (1) To inform non-ICI companies (Shell, Ciba-Geigy, etc.) who approach us to tell us of their intention to market Taiwanese paraquat.
  - ✓ (2) To inform registration authorities in some countries. This obviously needs to be done with care, and only to authorities believed to be sympathetic to such facts.
  - (3) A more subtle method of bringing the impurities to the attention of registration authorities is by means of a tightened specification for paraquat - which could include setting a limit on terpyridyl content and proposing thin layer chromatographic analysis as a method of assessing purity. It is possible that this method can be used to demonstrate the presence of PP796 (the emetic agent) in the new safer formulation. We are considering how to prepare such a revised specification.
- Such a new specification of this kind could be submitted to individual country registration authorities and also to FAO, although it is likely to be at least 2 years before a specification submitted to the latter comes into common use.
- ✓ (4) To inform government agencies concerned with the approval of competitive manufacture using Taiwanese technology. It has already been policy to alert the authorities to the hazards inherent in the HTS process: in future, their attention could be drawn to the possibility of hazards arising from Taiwanese paraquat.

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PPD wish to inform the various multinational companies who have handled Taiwanese product or who have shown interest in doing so that we have information about impurities and intend to use it in these ways: approach to registration authorities will therefore be delayed for two or three weeks to enable this to be done.

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We believe that this information about impurities can be a very useful weapon to use against the competition. PPD have also accumulated a range of other information about Taiwanese paraquat relating to inconsistency of concentration, variability of pH, shoddiness of packaging etc., and this is being assembled into a dossier which could be useful to you and as information for registration people. I will send you a copy when it becomes available. Alan Calderbank has sent this information to Hans Franke. Like Alan, I suspect Chevron would prefer to keep this information confidential until the time real attempts are made to register Taiwanese material with EPA. As far as I know, Alan has had no reply so far on this issue from Hans Franke.

Yours sincerely,

  
D. W. Barrett  
Technical Services Manager

DWB/njp  
Enclosures

CC: P. A. Davies - PPD - Fernhurst  
A. Calderbank- PPD - Jealotts Hill  
D. C. Walker

absence of terpyridyl  
confirmed by gas  
chromatography

known component  
(monopyridone)

paraquat

toxic impurity  
(2,2',6',2''-terpyridyl)  
(presence confirmed by gas  
chromatography)

other unknown  
impurities

paraquat

*Taiwanese Paraquat  
Sample 2*

absence of terpyridyl  
confirmed by gas  
chromatography

known component  
(monopyridone)

paraquat

I C I paraquat

toxic impurity  
(2,2',6',2''-terpyridyl)  
(presence confirmed by gas  
chromatography)

other unknown  
impurities

paraquat

*ICI paraquat  
sample 1*