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POTENTIAL PATHWAYS FOR MALATHION DEGRADATION UNDER TROPICAL STORAGE CONDITIONS

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A major fire occurred at Mulleriyawa Malathion Store on 01-12-85. Subsequent investigations[1] attributed chemical degradation of malathion to be one of the major factors contributing to the cause of the fire.

A comprehensive GLC study of samples salvaged just before the fire and of samples taken from Regional Stores around the country was undertaken with a view to establishing the probable degradation pathways of Malathion WDP under tropical storage conditions.

Our results indicated extensive degradation in some of the samples taken from the Mulleriyawa Store. In one of these specimens the initial Malathion level of 50% had been reduced to less than 5%.

The GLC pattern of the degradation products was similar to that reported in the literature[2]. However, the percentage of the various components differed considerably. Based on these results a probable route for the degradation is proposed where after an initial elimination step one of the resulting intermediates 0,0-Dimethyl phosphorodithioic acid reacts further with malathion to release Diethyl thiomalate which is converted to Tetraethyl dithiodisuccinate and Tetraethyl thiodisuccinate, two major degradation products identified in the mixture.

References

1. Report on the Fire at Malathion Store, Mulleriyawa, Ministry of Health.
2. Baker E.L. et al (1978) Epidemic malathion poisoning in Pakistan Malaria Workers Lancet (1) 31-33.