

AN= 3118
deleted

FINAL REPORT

Submitted by

Sara M. Debanne, Ph.D.

November 30, 1987

BFG19408

22203001

Data identified as describing the mortality responses to four doses (geometric progression of weights in g) of each of 16 PVC sample compositions tested using the New York Combustion Toxicity test was received from Dr. Hinderer.

The data for each sample were analyzed by the Debanne-Haller method of deriving statistically preferred LD50's with their 95% fiducial limits (Debanne-Haller, 1985). Table 1 summarizes the results of this analysis by presenting LD50's, their fiducial limits, and the results of statistical tests addressing the presence of a dose-response relationship and goodness of model fit for each of the arc sine and probit transformations of mortality data. The preferred LD50 was chosen as that estimate derived from the model yielding shortest fiducial limits where a significant dose-response relationship was indicated. In situations where the chi-square goodness-of-fit statistic showed significant departure from the model, a heterogeneity factor was utilized in the calculations.

There were three types of results indicated in Table 1; namely, (1) those situations resulting in solid fiducial intervals, (2) those resulting in vague fiducial intervals due to arithmetically forcing a calculation of fiducial limits even when no significant dose-response relationship was detected, and (3) those situations which did not permit even arithmetical calculation of fiducial limits.

12 substances yielded solid fiducial limits, substances B-3 and PVC-2 yielded only vague fiducial intervals and substances P-1 and PVC-4 had no preferred model.

22203002

BFG19409

To address the issue of whether the 16 PVC sample compositions indicated disjoint toxicity classes, it is noted that restricting consideration to solid fiducial intervals (i.e., those of the first type) yields a set of overlapping intervals over the range 5.3383 to 22.1027 grams. If the vague fiducial intervals are also considered, the fiducial intervals overlap moreso, as the vague intervals were extremely broad.

It may also be added that although the fiducial intervals of certain substances were disjoint from those of others (viz., A-2, A-9, P-2, and P-9 had distinct intervals from that of P-6), they all overlapped with the solid preferred fiducial intervals for each of the substances A-1, B-2, and B-6.

In summary, using the fiducial interval approach of Debanne-Haller to determine toxicity classes leads to the conclusion that the 12 substances with solid fiducial intervals are of the same classification since the technique gives them mutually overlapping fiducial intervals.

REFERENCES

Debanne, S.M. and Haller, H.S. (1985) "Evaluation of statistical methodologies for estimation of median effective dose". TAP 79, 274-282.

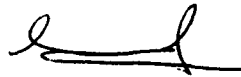
BFG19410

22203003

ID	PROBIT					ARC SINE					PREFERRED	
	LD50	LL	UL	t	X ²	LD50	LL	UL	t	X ²		
A1	14.9127	2.8030	21.9629	*	NS	15.0142	6.4191	19.9544	*	NS	arc	sine
A2	7.7562	--	--	NS	NS	7.6884	7.3801	8.0815	*	NS	arc	sine
A9	8.6372	6.1723	10.8433	*	NS	8.7495	6.4753	10.5744	*	NS	arc	sine
P1	5.6875	--	--	NS	NS	5.6453	--	--	NS	NS	--	
P2	8.3361	--	--	NS	NS	8.5533	7.0484	9.6906	*	NS	arc	sine
P6	14.3104	11.8347	18.2839	*	NS	14.1656	12.2081	18.7657	*	NS	probit	
P9	8.6302	--	--	NS	NS	8.8512	7.6226	10.0073	*	NS	arc	sine
B1	9.0282	7.0790	11.3575	NS	NS	9.1289	7.5182	11.0834	*	NS	arc	sine
B2	10.3645	7.4059	13.0118	*	NS	10.4993	7.7698	12.6898	*	NS	arc	sine
B3	13.8880	--	--	NS	NS	13.8509	10.3609	34.9137	NS	NS	arc	sine
B4	11.5887	--	--	NS	NS	11.2989	9.9935	13.1217	*	NS	arc	sine
B6	12.4005	2.3320	18.2677	*	NS	12.4857	5.3383	16.5913	*	NS	arc	sine
PVC1	16.6730	13.2814	23.3368	*	NS	16.5875	13.8733	22.1027	*	NS	arc	sine
PVC2	13.8874	--	--	NS	NS	13.8498	10.3581	34.8446	NS	NS	arc	sine
PVC3	13.7136	11.3743	16.7396	*	NS	13.6070	11.7378	16.5215	*	NS	arc	sine
PVC4	9.9645	--	--	NS	NS	10.0002	--	--	NS	NS	--	

BFG19411

22203004



Signature

Jan 12, 1988

Date

22203005

BFG19412