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Biochemical Research Laboratory

The Dow Chemical Company

BC T2.43-143-1

COMPARATIVE EYE IRRITATION STUDIES
CONDUCTED ON NINE EXPERIMENTAL HAIR
SPRAY FORMULATIONSFile T2.43-143-1
Chg. 2505
Ref. See below
Source TS+D
Sub. By R. Frankoski
Rept. By K. J. Olson

Signed

K. J. Olson, July 12, 1965

Checked

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CENTRAL RESEARCH INDEX

Nine hair spray formulations (aerosols) were submitted to the Biochemical Research Laboratory for comparison insofar as eye irritating properties are concerned. The composition of the formulations appears in the accompanying table.

The nine hair spray formulations were submitted subsequently to the Industrial Bio-Test Laboratories, Incorporated, of Northbrook, Illinois, for evaluation. The report by Bio-Test describing the laboratory procedure employed and the results of the tests are incorporated in this report.

GENERAL COMMENT

It will be noted from the data presented by Industrial Bio-Test that there are no significant differences between the nine formulations submitted. It will also be noted that the formulations are severely to extremely irritating to the rabbit eye.

R&S168029

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In order to further evaluate these results the writer contacted Dr. John Kay of Industrial Bio-Test in person. He indicated that relative to current hair spray products on the market these formulations are considerably more irritating. He further indicated that most hair spray formulations are capable of producing some corneal injury to the eye. In his opinion, while the subject formulations are severely injurious, the effects would likely not be of a permanent nature.

In the opinion of the writer it would be highly desirable that any formulation which Dow would be interested in marketing should be no more irritating than those already on the market by other companies.

RAST 68030

PER CENT CONCENTRATIONS OF COMPONENTS IN HAIR SPRAY FORMULATION

	<u>IA</u>	<u>IB</u>	<u>IC</u>	<u>IIA</u>	<u>IIB</u>	<u>IIC</u>	<u>IIIA</u>	<u>IIIB</u>	<u>IIIC</u>
Chlorothene NU	50.0	50.0	25.0	50.0	50.0	25.0	50.0	50.0	25.0
Ethanol SDA 40	29.8	29.8	44.8	29.8	29.8	44.8	29.8	29.8	44.8
Vinyl chloride	--	15.0	15.0	--	15.0	15.0	--	15.0	15.0
Freon 12	15.0	--	--	15.0	--	--	15.0	--	--
Freon 11's	--	--	10.0	--	--	10.0	--	--	10.0
Nitrous oxide	2.0-2.5	2.0-2.5	2.0-2.5	2.0-2.5	2.0-2.5	2.0-2.5	2.0-2.5	2.0-2.5	2.0-2.5
Dimethyl phthalate	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
PV/VA: 60/30	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Butylene oxide*	0.25	0.25	0.125	0.25	0.25	0.125	0.25	0.25	0.125
Nitromethane*	0.25	0.25	0.125	--	--	--	--	--	--
1,4-Dioxane*	2.0	2.0	1.0	--	--	--	2.0	2.0	1.0
sec-Butanol*	--	--	--	0.125	0.125	0.062	--	--	--
Propargyl alcohol*	--	--	--	--	--	--	0.25	0.25	0.125

*Chlorothene inhibitors - % in total formulation.

PER CENT CONCENTRATIONS OF COMPONENTS IN HAIR SPRAY FORMULATION

	<u>IA</u>	<u>IB</u>	<u>IC</u>	<u>IIA</u>	<u>IIB</u>	<u>IIC</u>	<u>IIIA</u>	<u>IIIB</u>	<u>IIIC</u>
Chlorothene NU	50.0	50.0	25.0	50.0	50.0	25.0	50.0	50.0	25.0
Ethanol SDA 40	29.8	29.8	44.8	29.8	29.8	44.8	29.8	29.8	44.8
Vinyl chloride	--	15.0	15.0	--	15.0	15.0	--	15.0	15.0
Freon 12	15.0	--	--	15.0	--	--	15.0	--	--
Freon 11's	--	--	10.0	--	--	10.0	--	--	10.0
Nitrous oxide	2.0-2.5	2.0-2.5	2.0-2.5	2.0-2.5	2.0-2.5	2.0-2.5	2.0-2.5	2.0-2.5	2.0-2.5
Dimethyl phthalate	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
PV/VA: 60/30	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Butylene oxide*	0.25	0.25	0.125	0.25	0.25	0.125	0.25	0.25	0.125
Nitromethane*	0.25	0.25	0.125	--	--	--	--	--	--
1,4-Dioxane*	2.0	2.0	1.0	--	--	--	2.0	2.0	1.0
sec-Butanol*	--	--	--	0.125	0.125	0.062	--	--	--
Propargyl alcohol*	--	--	--	--	--	--	0.25	0.25	0.125

*Chlorothene inhibitors - % in total formulation.