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H. Carson, MD.
20 March 1968

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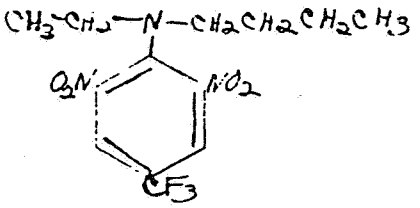
Trade name: BALAN®

Manufacturer: Elanco Products Co. (division of Eli Lilly and Co.)

Common (generic) name: Benefin

Chemical Name: N-Butyl-N-ethyl-α, α, α-trifluoro-2,6-dinitro-p-toluidine

Chemical structure:



Use: Herbicide

Physical state: exists as a yellow-orange crystalline solid in pure form.

Solubility: high - organic solvents such as acetone and xylene.
low - solvents such as ethanol
H_2O - 70 ppm at 25°C. (Crystallization can occur below 40°F.)

Vapor pressure: 4×10^{-7} mm Hg at 25°C.

B.P.: 121 - 122°C. at 0.5 mm Hg.
148 - 149°C. at 7 mm Hg.

Stability: Susceptible to decomposition by ultraviolet irradiation.

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BENEFIN (Balan)

Acute Rat Oral (Tech):		$LD_o > 5$ g/kg
	(256% E.C.):	$3650 < LD_{50} < 8370$ mg/kg
	(21.0% E.C.):	LD_{50} = 5210 mg/kg
	(25.6% E.C.):	$LD_o > 10$ g/kg (M&F)
	(1.15% granular)	$LD_o > 10$ g/kg
Acute Weanling Rat Oral	(~25% E.C.)	$LD_o >$ [illegible] g/kg
Acute Newborn Rat Oral	(<24 hours) (25% E.C.)	LD_{50} = 0.79 + 0.08 g/kg
Acute Mouse Oral (25% E.C.):		$LD_o > 5$g/kg
	(1.15% granular):	$LD_o > 5$g/kg
Acute Chicken Oral (~25% E.C.)		$LD_o > 2$g/kg
Acute Rabbit Oral (~25% E.C.)		$LD_o > 2$g/kg
Acute Dog Oral (Tech):		$LD_o > 200$ mg/kg
	(~25% E.C.)	$LD_o > 2$g/kg
	(1.15% granular):	$LD_o > 200$ mg/kg
Acute Rabbit Dermal (E.C. 25.6%):		$LD_{50} > 1860$ mg/kg
		No significant changes
	(25.6% E.C.):	$LD_{50} > 4650$ mg/kg
	(25% E.C.):	$LD_o > 0.2$ g/kg, no irritation
	(1.15% granular):	$LD_o > 2$g/kg
Acute Rabbit Skin Irritation	(25.6% E.C.)	Draize Score =0
	(25.6% E.C.):	Draize Score = 0
	(1.15% granular):	Mild irritation
Acute Rabbit Skin and Eye Irritation (Tech):		200 mg/kg applied to intact skin produced no irritation. 1 mg in one eye produced no irritation

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(1.15% granular):	200 mg/kg applied on intact skin and 1 mg in one eye produced no irritation.
Acute Rabbit Eye Irritation (25.6% E.C.):	One drop in one eye produced mild corneal, ~~critical~~ vidual and conjunctival irritation at 72 hours.
(25% E.C.):	1 mg produced no irritation.
Acute Rat Inhalation (Tech):	No effects noted upon exposure to a 5% mist of the test material in dimethylformamide
(25.6% E.C.):	LC_{50} ♂ 56 mg/l/hr. LC_{50} ♀ 48 mg/l/hr.
(25% E.C.):	LD_0 71.33 mg/l/hr, no effects noted.
(1.15% granular):	1.3 mg/l produced no effect.
Subacute Rat Dermal (3 weeks) (25.6% E.C.):	No significant effects at 4650 mg/kg except for a mild dermatitis.
Subacute Rat Feeding (3 months) (Tech):	Retarded growth at 10,000 and 20,000 ppm. Dose related depression of RBC, HCT, and Hgb noted (questionable biological significance). No gross or microscopic pathology at lower levels (5000,2500,1250 ppm) Inclusion bodies in hepatic cells seen at 10,000 and 20,000 ppm.
Subacute Dog Feeding (Tech) (3 months)	No significant effect level 500 ppm. At 8000 ppm all animals lost weight and showed depression of red cell parameters. No other significant effects.

The toxicological data on Benefin (Balan) has been reviewed. The data indicates that the material in technical, emulsifiable concentrate and granular formulations has at low order of toxicity.

This material is highly insoluble in water.

No undue hazard is forseeable with the use of this material. No objection to registration is cast.

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