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Clinical Toxicology of Commercial Products

ACUTE POISONING

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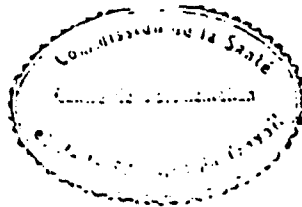
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SECTION III: D. INGREDIENTS INDEX

523

523 Butyl Myristate

May be hydrolyzed in vivo to myristic acid and butyl alcohol. Myristic (tetradecanoic) acid is a digestible constituent of animal and vegetable fats. See Butyl alcohol in the index.

Aromatic

524

524 Ethyl Acetate

Acetic ether

Toxicity rating: 3. Relatively innocuous (probably near the borderline between toxicity classes 2 and 3). Mild local irritation and central nervous depression.

Ref.: Spelman et al., 1945.

Silylic ac
Toxicity
other rou
Ref.: Fis.

525

525 Ethyl Formate

Toxicity rating: 3. Produces irritation and central nervous depression. A much stronger irritant than ethyl acetate, probably because of hydrolysis to formic acid.

Ref.: Smyth et al., 1954.

Methyl a
The toxic

526

526 Ethyl Lactate

Ethyl α -hydroxypropionate

Toxicity rating: 3. Industrial solvent and possible vehicle for parenteral drug administration. No industrial toxicity is recognized. Subcutaneous and intravenous LD₅₀'s in mice are 2.5 and 0.6 ml/kg., respectively. Irritating in the rabbit eye and in guinea pig skin (intradermal injection).

Ref.: Latven and Molitor, 1939.

Benzene
Toxicity
lethal do
When in
Ref.: Ho.

527

527 Glycerol Esters

e.g., Glycerol oleate, Glycerol phthalate, etc.

If any of these esters is significantly toxic, the acid portion must be held responsible, not the glycerol. See corresponding acid in the index. Neutral fats in the diet are triglycerides of fatty acids, such as oleic and stearic acids. Monoglycerol esters of fatty acids are used as emulsifying agents in cosmetics and are produced in the body whenever fat is partially digested.

Ref.: Hine et al., 1953b; Pfeiffer and Arno, 1937.

Toxicity
incoordi
skin irrit
Ref.: Gr.

528

528 Isoamyl Acetate

Banana oil, Pear oil, Amyl acetate

Toxicity rating: 3(?). Like other simple esters, an irritant and central nervous depressant. More narcotic than ethyl acetate and more irritating than butyl. Vapor has produced edema of the glottis. Secondary amyl acetate is thought to be qualitatively (and perhaps quantitatively) similar in toxicity to the commoner isoamyl ester.

Ref.: American Petroleum Institute, 1953a.

Lo. Met
Used as
dentifrice
Consult t

529

529 Methyl Formate

Toxicity rating: 3(?). Vapor produces irritation of mucous membranes and central nervous depression. More toxic than methyl acetate. Symptoms resemble methyl alcohol poisoning.

See also: Methyl Alcohol, Reference Congener in Section III.

Ref.: Schrenk et al., 1936.

Methyl p
Not toxic
preservat
Ref.: Oac

530

530 Monoacetin

Acetin, Glyceryl monoacetate

Toxicity rating: 1. Often contaminated with glycerin. Largely (but not completely) hydrolyzed in bowel to glycerin and acetic acid. May disturb acid-base balance. Given subcutaneously or intramuscularly to laboratory animals (including monkeys), it produces vasodilation, central nervous depression, and death from respiratory failure (mean lethal dose 1 to 5 gm/kg.). Antidote of choice for fluoroacetate poisoning.

Ref.: Li et al., 1941.

Propyl p
Toxicity
2. All of
studies d
Ref.: Oac

531

531 Propyl Acetate

n-Propyl acetate, Isopropyl acetate

Toxicity rating: 3. Like other simple esters, mild irritant and central depressant actions. Probably these compounds lie near the borderline between toxicity classes 2 and 3.

Ref.: Browning, 1953.

Lo. Met
Toxicity
between
hazardous
Ref.: Ho

532

532 Triacetin

Glyceryl triacetate

Toxicity rating: 1. Laboratory rats have tolerated diets consisting of 50% triacetin. If hydrolyzed, systemic acidosis is a possible consequence.

Ref.: Li et al., 1941.

Nitrolic
Toxicity
body to
mortality
Ref.: Ho

e.g., Dm
Toxicity
subject has
mortality
result of a
central
Glycerol
Triacetin
Ref.: Ho

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SECTION III: A. INGREDIENTS INDEX

TABLE II-1

Toxicity Rating or Class	Probable Oral I.ETHAL. Dose (Human)	
	Dose	For 70 kg. person (150 lb.)
6 Supertoxic	less than 5 mg./kg.	A taste (less than 7 drops)
5 Extremely toxic	5-50 mg./kg.	Between 7 drops and 1 teaspoonful
4 Very toxic	50-500 mg./kg.	Between 1 tsp. and 1 ounce
3 Moderately toxic	0.5-5 gm./kg.	Between 1 oz. and 1 pint (or 1 lb.)
2 Slightly toxic	5-15 gm./kg.	Between 1 pt. and 1 quart
1 Practically non-toxic	above 15 gm./kg.	More than 1 quart (2.2 lb.)

clinical literature are usually considerably lower than those implied by the current ratings.

4. With only a few compounds are clinical data adequate to establish a toxicity rating. Most of the values here are based on laboratory determinations of mean lethal doses (LD₅₀) in small laboratory mammals (rat, mouse, guinea pig, rabbit; sometimes cat, dog and monkey). Implicit in the use of such data is the conventional assumption that the mean lethal dose in man lies in the same class as does the LD₅₀ for the test animals. Whenever available, however, clinical data and even clinical impressions have been given precedence.

5. Toxicity ratings followed by interrogation points are based on obviously inadequate data; some represent no more than guesses.

6. For most corrosive agents, such as mineral acids, alkalis, bleaches, etc., no toxicity rating is suggested. In these cases death is usually the result of severe local tissue injury, with secondary complications such as toxemia, shock, perforation, infection, hemorrhage and obstruction. The intensity of the local lesion and of its sequelae is often determined by the concentration of the corrosive substance, whereas the volume and "dose" are secondary considerations. For such agents no single toxicity rating is an appropriate measure of lethality, unless the concentration is also specified. No simple parameter describes this relation in a way which is thought to be clinically useful.

7. In Table II-1 common units of measure are used to describe lethal doses for an adult of average size (body weight of 150 lb. or 70 kg.). For patients who are heavier or lighter, probable lethal doses are proportionately larger or smaller, and they can be readily estimated from values of mg./kg. recorded in the table. Whereas we appreciate that infants and children are not simply small adults, reliable clinical data are so scarce that we are forced to assume that lethal doses are proportional to

body weight irrespective of age. Recognized exceptions are noted in Sections II and III.

8. Although all are based on Table II-1, toxicity ratings in this section have a distinctly different meaning from those in Section VI. In Section VI each rating is an estimate of the toxicity of a complete commercial product, as it is marketed and as it is described in Section VI. Here in the Ingredients Index, each rating is a measure of the inherent toxicity of a single ingredient. In establishing the toxicity ratings listed here, each dose has been calculated in terms of a single substance (usually technical grade) and is generally based on experiments in which only an innocuous solvent or vehicle was used (such as water, corn oil, etc.), omitting all solvents, additives, and other ingredients found in the usual commercial formulations. Because many of the ingredients listed here are unavailable to the consumer in pure or undiluted form, the toxicity ratings in Section VI are more realistic in terms of clinical exposure but are almost invariably less reliable than those in this section.

Acknowledgments

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