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Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade
Chemical Review Committee
Second meeting
Geneva, 13–17 February 2006
Item 5 (b) of the provisional agenda*

Inclusion of chemicals in Annex III of the Rotterdam Convention: review of notifications of final regulatory actions to ban or severely restrict a chemical: methyl parathion

Methyl parathion: supporting documentation provided by Thailand

Note by the secretariat

The annex to the present note contains the supporting documentation provided by Thailand in support of its final regulatory action on methyl parathion.

* UNEP/FAO/RC/CRC.2/1.

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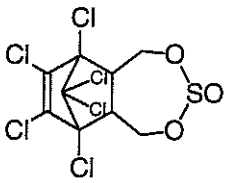
Annex

List of supporting documentation on methyl parathion from Thailand

- Pesticide Manual 13th Edition

294 endosulfan *Insecticide, acaricide*

IRAC 2A; cyclodiene



NOMENCLATURE: Common name endosulfan (BSO, E-ISO, (*m*) F-ISO, ANSI, ESA); thiodan (Iran, USSR); benzoepin (JMAF); no name (Italy)
IUPAC name (1,4,5,6,7,7-hexachloro-8,9,10-trinorborn-5-en-2,3-ylenebismethylene) sulfite; 6,7,8,9,10,10-hexachloro-1,5,5a,6,9,9a-hexahydro-6,9-methano-2,4,3-benzodioxathiepine 3-oxide
Chemical Abstracts name 6,7,8,9,10,10-hexachloro-1,5,5a,6,9,9a-hexahydro-6,9-methano-= 2,4,3-benzodioxathiepine 3-oxide
CAS RN *[115–29–7]* endosulfan; *[959–98–8]*, formerly *[33213–66–0]* alpha-endosulfan; *[33213–65–9]*, formerly *[891–86–1]* and *[19670–15–6]* beta-endosulfan **EC no.** 204–079–4
Development codes Hoe 02 671 (Hoechst); FMC 5462 **Official codes** OMS 204 (α); OMS 205 (β); OMS 570; ENT 23979

PHYSICAL CHEMISTRY: Composition Endosulfan is a mixture of two stereoisomers: alpha-endosulfan, endosulfan (I), stereochemistry 3α,5aβ,6α,9α,9aβ-, comprises 64–67% of the tech. grade; beta-endosulfan, endosulfan (II), stereochemistry 3α,5aα,6β,9β,9aα-, comprises 29–32%. Earlier reports on the stereochemistry of these isomers gave conflicting accounts (W. Riemschneider, *World Rev. Pest Control*, 1963, **2**(4), 29). **Mol. wt.** 406.9 **M.f.** $C_9H_6Cl_6O_3S$ **Form** Colourless crystals; (tech., cream to brown, mostly beige). **M.p.** ≥80 °C (tech.); α- 109.2 °C; β- 213.3 °C **V.p.** 0.83 mPa (20 °C) for 2:1 mixture of α- and β- isomers K_{ow} logP for α- = 4.74; β- = 4.79 (both at pH 5) **Henry** α- 1.48; β- 0.07 (both Pa m^3 mol^{-1}, 22 °C, calc.) **S.g./density** *c.* 1.8 (20 °C) (tech.) **Solubility** In water alpha-endosulfan 0.32, beta-endosulfan 0.33 (both in mg/l, 22 °C). In ethyl acetate, dichloromethane, toluene 200, ethanol *c.* 65, hexane *c.* 24 (all in g/l, 20 °C). **Stability** Stable to sunlight. Slowly hydrolysed in aqueous acids and alkalis, with the formation of the diol and sulfur dioxide.

COMMERCIALISATION: History Insecticide reported by W. Finkenbrink (*Nachrichtenbl. Dtsch. Pflanzenschutzdienstes (Braunschweig)*, 1956, **8**, 183). Introduced by Hoechst AG (now Bayer CropScience) and, in the USA, by FMC Corp. **Patents** DE 1015797; US 2799685; GB 810602 (all to Hoechst) **Manufacturers** Aako; Bayer CropScience; Drexel; Excel; Hindustan; Makhteshim-Agan; Milenia; Parry; Seo Han; Sharda.

APPLICATIONS: Biochemistry Antagonist of the GABA receptor-chloride channel complex. **Mode of action** Non-systemic insecticide and acaricide with contact and stomach action. **Uses** Control of sucking, chewing, and boring insects and mites on a very wide range of crops, including fruit (including citrus), vines (0.1–0.2%), olives, vegetables including potatoes (0.1–0.2%), ornamentals, cucurbits, cotton (1.5–2.5 l/ha), tea (1.0–2.0 l/ha), coffee (1.5–2.0 l/ha), rice (1.5–2.0 l/ha), cereals (1.0–2.0 l/ha), maize and sorghum (1.5–2.5 l/ha), oilseed crops (1.0–2.0 l/ha), hops, hazels and sugar cane (1.5–2.5 l/ha), tobacco (0.8–1.5 l/ha), alfalfa, mushrooms, forestry, glasshouse crops, etc. Also controls tsetse flies. **Phytotoxicity** Glasshouse geraniums and chrysanthemums, alfalfa, and lima beans may be injured. **Formulation types** DP; EC; GR; SC; UL; WP; Powder concentrate. **Compatibility** Incompatible with strongly alkaline

pest guide manual 13th EDITION

materials. **Selected products** 'Fan' (FMC); 'Afidanil' (Efthymiadis); 'Algodán 350' (Ingeniería Industrial); 'Cekulfan' (Cequisa); 'Davonil' (Vapco); 'Devisulfan' (Devidayal); 'Endocel' (Excel); 'Endodhan' (Dhanuka); 'Endosol' (Aimco); 'Endostar' (Shaw Wallace); 'Hildan' (Hindustan); 'Lucasulfan' (Lucava); 'Mentor' (Crop Health); 'Phaser' (Bayer CropScience); 'Speed' (Nagarjuna Agrichem); 'Thiodan' (Bayer CropScience); 'Thionex' (Makhteshim-Agan); **mixtures** 'Tomahawk' (+ ethion) (Calliope).

ANALYSIS: **Product** analysis by glc (*CIPAC Handbook*, 1985, **1C**, 2110; *AOAC Methods*, 17th Ed., 983.08). **Residues** determined by glc with MCD (*ibid.*, 976.23; *Pestic. Anal. Man.*, 1979, 201-A, 201-G, 201-I; 405; A. Ambrus et *al.*, *J. Assoc. Off. Anal. Chem.*, 1981, **64**, 773; *Man. Pestic. Residue Anal.*, 1987, **I**, 5, 6, S19; *Anal. Methods Residues Pestic.*, 1988, Part I, M1, M12). Endosulfan isomers in **drinking water** by glc with ECD (*AOAC Methods*, 17th Ed., 990.06). Further methods available on request from Bayer CropScience.

MAMMALIAN TOXICOLOGY: **Reviews** FAO/WHO 83, 85 (see part 2 of the Bibliography). **Oral** Acute oral LD_{50} for rats 70 mg (in aqueous suspension)/kg, 110 mg tech. (in oil)/kg, 76 mg alpha- isomer/kg, 240 g beta- isomer/kg; for dogs 77 mg tech./kg. **Skin and eye** Acute percutaneous LD_{50} for rabbits 359 mg (in oil)/kg; for male rats >4000, female rats 500 mg/kg. **Inhalation** LC_{50} (4 h) for male rats 0.0345, female rats 0.0126 mg/l. **NOEL** (2 y) for rats 15 ppm diet; (1 y) for dogs 10 ppm diet. **ADI** (JMPR) 0.006 mg/kg b.w. [1998]. **Toxicity class** WHO (a.i.) II; EPA (formulation) I (tech.) **EC classification** T; R24/25| Xi; R36| N; R50, R53

ECOTOXICOLOGY: **Birds** Acute oral LD_{50} for mallard ducks 205–245, ring-necked pheasants 620–1000 mg/kg. **Fish** Highly toxic (LC_{50} (96 h) for golden orfe 0.002 mg/l water) but, in practical use, should be harmless to wildlife. **Daphnia** LC_{50} (48 h) 75–750 µg/l. **Algae** EC_{50} (72 h) for green algae >0.56 mg/l. **Bees** Not toxic to bees under field conditions at an application rate of 1.6 l/ha (560 g endosulfan/ha). **Worms** NOEC 0.1 mg/kg dry weight.

ENVIRONMENTAL FATE: **EHC** 40 (WHO, 1984). **Animals** The principal route of elimination is faeces; most of the radioactivity is excreted within the first 48 hours. The amounts excreted are independent of dose level, number of dosages and isomerism. There are indications of species-specificity. Residues of endosulfan accumulate in the kidneys rather than in fat. Elimination from the kidneys takes place with DT_{50} 7 d, but there is no sign of accumulation in the kidneys even after long-term feeding. Endosulfan is metabolised rapidly in mammalian organisms to less-toxic metabolites and to polar conjugates. **Plants** The plant metabolites (mainly endosulfan sulfate) were also found in animals and have thus been investigated from a toxicological point of view. 50% of residues are lost in 3–7 days (depending on plant species). **Soil/Environment** Endosulfan (alpha- and beta-) is degraded in soil with DT_{50} 30–70 d. The main metabolite usually found was endosulfan sulfate, which is degraded more slowly and is, for this reason, the most important metabolite. DT_{50} for total endosulfan (alpha- and beta- endosulfan and endosulfan sulfate) in the field is 5–8 mo. No leaching tendency was observed. K_{oc} 3000–20 000; K_d <3%.