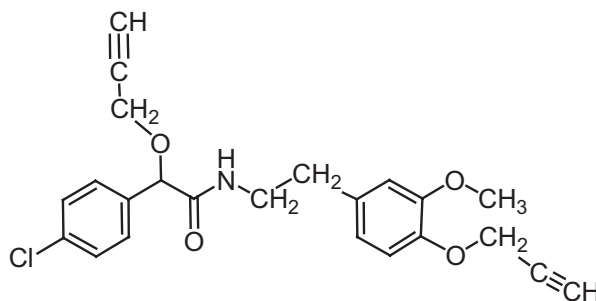


532 mandipropamid

Fungicide

FRAC 40, F5; mandelamide



NOMENCLATURE: **Common name** mandipropamid (BSI, E-ISO, (m) F-ISO)

IUPAC name (RS)-2-(4-chlorophenyl)-N-[3-methoxy-4-(prop-2-ynoxy)phenethyl]-2-(prop-2-ynoxy)acetamide

Chemical Abstracts name 4-chloro-N-[2-[3-methoxy-4-(2-propynyloxy)phenyl]ethyl]- α -(2-propynyloxy)benzeneacetamide

CAS RN [374726-62-2] **Development codes** NOA 446510

PHYSICAL CHEMISTRY: **Mol. wt.** 411.9 **M.f.** C₂₃H₂₂ClNO₄ **Form** Light beige powder.

M.p. 96.4–97.3 °C **V.p.** <9.4 × 10⁻⁴ mPa (25–50 °C) **K_{ow}** logP = 3.2

Henry <9.2 × 10⁻⁵ Pa m³ mol⁻¹ (25 °C, calc.) **S.g./density** 1.24 (22 °C) **Solubility** In water 4.2 mg/l (25 °C). In *n*-hexane 0.042, *n*-octanol 4.8, toluene 29, methanol 66, ethyl acetate 120, acetone 300, dichloromethane 400 (all in g/l, 25 °C); (EPA Fact Sheet). **Stability** Stable to hydrolysis at pH 4–9.

COMMERCIALISATION: **History** Discovered in 1999 by Syngenta AG. Reported by F. Huggenberger *et al.* (*Proc. BCPC Int. Congr.*, Glasgow, 2005, **1**, 87). **Manufacturers** Syngenta

APPLICATIONS: **Biochemistry** Proposed inhibitor of phospholipid biosynthesis and cell wall synthesis. **Mode of action** Preventive foliar fungicide, with some curative activity, effective against spore germination and also inhibits mycelial growth and sporulation. Adsorbed to the plant wax layer, providing resistance to rainwater wash-off. Once mandipropamid is taken up by the plant tissue, translaminar mobility provides protection of the opposite leaf surface. **Uses** Under development for control of Oomycete diseases, such as *Plasmopara viticola* in grapes, *Phytophthora infestans* in potatoes and tomatoes, and *Pseudoperonospora cubensis* in cucurbits, at 100–150 g/ha. **Formulation types** SC; WG. **Selected products** 'Revus' (Syngenta); **mixtures** 'Pergado MZ' (+ mancozeb) (Syngenta); 'Revus Opti' (+ chlorothalonil) (Syngenta).

ANALYSIS: **Product** by hplc/uv. **Residues**, and in soil by lc-ms/ms.

TOXICOLOGICAL & ENVIRONMENTAL REVIEWS: EC DAR, Jan. 2008. EPA Fact Sheet, Jan. 2008.

MAMMALIAN TOXICOLOGY: **Oral** Acute oral LD₅₀ for rats >5000 mg/kg.

Skin and eye Acute percutaneous LD₅₀ for rats >5050 mg/kg. Not irritant to skin and eye (rabbits). No potential for sensitisation (guinea pigs). **Inhalation** LC₅₀ for rats >5000 mg/m³. **NOEL** (1 y) NOAEL for dogs 5 mg/kg b.w. daily. Chronic NOAEL in rats 15 mg/kg b.w. daily. Not carcinogenic

in the rat or the mouse. **ADI/RfD** (EPA) cRfD 0.05 mg/kg b.w. [2008]. **Other** Not mutagenic, not teratogenic, no effects on reproduction.

ECOTOXICOLOGY: **Birds** Acute oral LD₅₀ for bobwhite quail >2250 mg/kg. **Fish** LC₅₀ (96 h) for rainbow trout >2.9 mg/l. **Daphnia** LC₅₀ (48 h) 7.1 mg/l. **Algae** EC₅₀ (96 h) for *Pseudokirchneriella subcapitata* >2.5 mg/l. **Other aquatic spp.** EC₅₀ (96 h) for eastern oysters 0.97 mg/l; (7 d) for *Lemna gibba* >6.8 mg/l. **Bees** LD₅₀ (contact and oral) >200 µg/bee. **Worms** LC₅₀ >1000 mg/kg. **Other beneficial spp.** Very low risk for beneficial arthropods.

ENVIRONMENTAL FATE: **Animals** In rats, rapidly absorbed and eliminated. Metabolism is extensive, and proceeds mainly by loss of one or both propargyl groups, followed by glucuronidation and *O*-demethylation. **Soil/Environment** Aqueous photolysis DT₅₀ 1.7 d (pH 7, 25 °C). Mean soil DT₅₀ (field) 17 d (range 2–29). Mean K_{oc} 847 ml/g (range 405–1294). Soil degradation DT₅₀ (lab., 20 °C, aerobic) 53 d; anaerobic degradation appears to be slower. Field dissipation DT₅₀ 20 d.