

3-month study, and effects in a 2-year study included hepatocellular swelling, mild anaemia, increased incidence of brown pigment in the kidneys (possibly indicative of slight degeneration of the tubular epithelium) and decreased urinary specific gravity and protein.

Dichlorvos

Dichlorvos (CAS No. 62-73-7) is a broad-spectrum organophosphorus insecticide used primarily for controlling household pests and for protecting stored products from insects. It is no longer approved for use in some jurisdictions because of concerns over its acute toxicity. Dichlorvos is expected to be very mobile in soils. It is rapidly degraded by microbial activity and hydrolysis in soil, and does not adsorb to sediments. Degradation in water occurs primarily through hydrolysis. There are relatively few studies on its occurrence in source waters. Exposure from food varies widely, depending on local circumstances and usage. Dichlorvos can be inhaled from its use as a domestic insecticide.

Reason for not establishing a guideline value	Occurs in drinking-water or drinking-water sources at concentrations well below those of health concern
Health-based value*	0.02 mg/l
Acute health-based value**	3 mg/l
Occurrence	Concentrations in surface water in the range 10–50 ng/l, but sometimes as high as 1500 ng/l, have been measured
ADI	0–0.004 mg/kg bw, based on a NOAEL of 0.04 mg/kg bw per day for the inhibition of erythrocyte acetylcholinesterase activity in a 21-day study in male volunteers and application of a safety factor of 10
ARfD	0.1 mg/kg bw, based on a NOAEL of 1 mg/kg bw for erythrocyte acetylcholinesterase inhibition in an acute oral study in male volunteers and application of a safety factor of 10
Limit of detection	0.01 µg/l (limit of quantification) based on solvent extraction and GC analysis; 0.1 µg/l (reporting limit) based on GC-MS
Treatment performance	Conventional treatment, including coagulation, filtration and chlorination, not effective; removal by membranes depends on membrane type and operational conditions. Removal by nanofiltration membranes has variable effectiveness (removal rates from 4 to 60%). Reverse osmosis would be expected to be effective (removal rates > 85%) based on removal studies and predictions.
Health-based value derivation	
• allocation to water	20% of upper bound of ADI
• weight	60 kg adult
• consumption	2 litres/day
Acute health-based value derivation	
• allocation to water	100% of ARfD
• weight	60 kg adult
• consumption	2 litres/day

12. CHEMICAL FACT SHEETS

Additional comments	The default allocation factor of 20% has been used to account for the fact that the available food exposure data, which suggest that exposure via this route is low, do not generally include information from developing countries, where exposure via this route may be higher, and as potential exposure via inhalation from indoor air resulting from use of dichlorvos as a domestic insecticide is unknown
	Guidance on interpreting the health-based value and deciding when to monitor can be found in section 8.5.3

Assessment date	2016
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Principal references	WHO (2012). <i>Pesticide residues in food – 2011 evaluations</i> WHO (2016). <i>Dichlorvos in drinking-water</i>
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* When a formal guideline value is not established, a “health-based value” may be determined in order to provide guidance to Member States when there is reason for local concern. Establishing a formal guideline value for such substances may encourage Member States to incorporate a value into their national standards when this may be unnecessary.

** For more information on acute health-based values, see [section 8.7.5](#).

As with other organophosphorus insecticides, the inhibition of cholinesterase activity, causing neurotoxicity, is the most sensitive toxicological end-point following acute or repeated exposures to dichlorvos. Dichlorvos is unlikely to be genotoxic in vivo or to pose a carcinogenic risk to humans. Some reproductive toxicity has been observed in rats, but dichlorvos was not found to cause developmental toxicity or to be teratogenic.

Dicofol

Dicofol (CAS No. 115-32-2) is an organochlorine acaricide that has been registered for broad-spectrum contact, non-systemic control of plant-eating mites in cotton, tea and a wide variety of fruit, vegetable and ornamental crops. Products containing dicofol, which is manufactured from DDT, are being phased out in the USA and are no longer approved for use in the European Union. Dicofol is unlikely to reach water, but may do so if bound to particulate matter subject to runoff. Dicofol is only slightly soluble in water and binds strongly to soil. There are few data on the occurrence of dicofol in water. Exposure from food varies widely, depending on local circumstances and usage. Dicofol has been proposed as a persistent organic pollutant under the Stockholm Convention.

Reason for not establishing a guideline value	Unlikely to be found in drinking-water or drinking-water sources*
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Health-based value**	0.01 mg/l
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Acute health-based value***	6 mg/l
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Occurrence	Not detected in limited groundwater monitoring
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ADI	0–0.002 mg/kg bw, based on a NOAEL of 0.22 mg/kg bw per day for histopathological changes in the liver and adrenal gland in a 2-year toxicity and carcinogenicity study in rats and application of a safety factor of 100
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