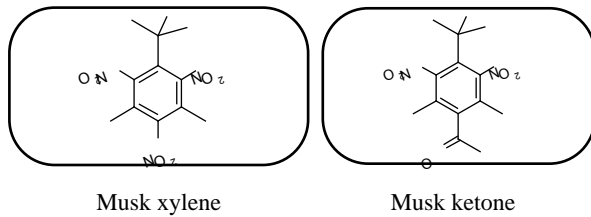


Use

Synthetic musk fragrances are very widespread in the home. They are used as low cost fragrances in soaps, perfumes, air fresheners, detergents, fabric softeners and other household cleaning products. Many of these products are ultimately disposed of to the sewers. As such, a large proportion will end up at sewage works and pass from there to rivers and ultimately the seas.

There are four synthetic musk fragrances accounting for 95% of those used. These are the nitro-musks (musk xylene, used in detergents and soaps, and musk ketone, used in cosmetics) and two polycyclic musks (known by their abbreviations 'HHCb' and 'AHTN'). See Table 1.

Global production was 7000 tonnes in 1988 but is likely to have increased significantly since then.

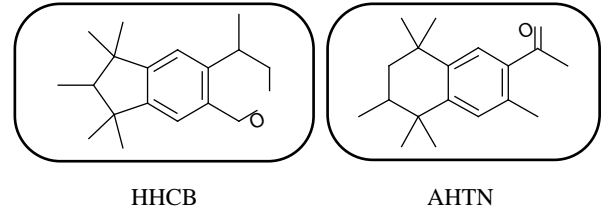


Toxicity

As for many synthetic chemicals in everyday use, there is a very serious lack of toxicity data on synthetic musks. However, we do know that synthetic musk fragrances are persistent, bioaccumulate in fatty tissue and are poorly degradable in the environment.

Of the few studies carried out, one has shown that long-term exposure to musk xylene causes cancer in mice. Of equally serious concern is the ability of musk ketone and

musk xylene breakdown products to mimic the hormone oestrogen. Laboratory studies on fish and frogs have shown these breakdown products to be endocrine disrupting chemicals (EDCs). The potential for oestrogenic activity of the polycyclic musks requires further investigation.



Human Exposure

Humans are most at risk from synthetic musk fragrances not only through their exposure from contaminated food species lower down the foodchain (shellfish, fish etc), but also through direct absorption through the skin from the many household sources of musk fragrances.

Synthetic musk fragrances have been found in human body fat, with nitro-musks found more in women than men. Polycyclic musks are also present in human fats. Some synthetic musks get passed to breast-feeding babies in breast milk (see Table 2).

As a result of these type of levels being found in human beings, the European Scientific Committee on Cosmetics has concluded that human exposure to musk xylene and musk ketone should be reduced.



Synthetic Musk Fragrances: Reasons for Concern

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Table 1: Usage of synthetic musk fragrances in Europe (tonnes)

	Nitro musks		Polycyclic Musks	
	Musk xylene	Musk ketone	HHCB	AHTN
1995	110	61	1482	585
1998	86	40	1473	385

Table 2: Levels of synthetic musk fragrances found in human breast milk

Musk ketone	0.01 - 0.2 mg/kg fat
Musk xylene	0.01 - 1.2 mg/kg fat

□

Environmental Fate and Exposure of Wildlife

Where sewage treatment exists, due to the fat-soluble, lipophilic ('fat loving') nature of synthetic musks, much will be retained in sewage sludge and disposed of to land or via incineration. Nevertheless, samples of seawater taken from the German Bight show that all types of synthetic musk fragrances are present in the marine environment.

Levels have also been examined in fatty fish (eels) and non-fatty fish from the River Ruhr. Musk xylene has also been found in marine fish, mussels and polycyclic musks in crabs and mussels (see Table 3). The breakdown products of musk xylene are also persistent. In the River Elbe the concentration of musk xylene breakdown products is four times that of musk xylene itself.

This includes the reduction and elimination of synthetic musk fragrances, which have the ability to disrupt endocrine systems and are present in human fatty tissue, human breast milk, wildlife and the wider aquatic environment.

WWF believes that the use of musk xylene, musk ketone and the polycyclic musks (AHTN and HHCB) should be banned as soon as possible. Voluntary reduction measures should be agreed in advance of such a ban to reduce as quickly as possible the environmental exposure of both humans and wildlife to this class of hazardous substances.

Text prepared by Guy Linley-Adams from research by Gwynne Lyons for WWF.

Table 3: Concentrations of synthetic musk fragrances in wildlife and the aquatic environment (wet weight µg/kg)

	Musk xylene	Musk ketone	HHCB	AHTN
Eels (Ruhr)	37 - 95	37 - 66	97 - 126	124 - 143
Non-eel fish (Ruhr)	<1 - 9	3 - 13	10 - 45	18 - 34
Mussels (North Sea)	-	-	up to 110	up to 60
Crabs (North Sea)	-	-	up to 370	up to 60

WWF Policy and Reduction of Inputs

In 1998, WWF welcomed and strongly supported the Sintra Statement made by the signatories to the OSPAR Convention which made firm commitments to protect the marine environment from hazardous substances. The OSPAR countries agreed to reduce the discharges of hazardous chemicals with the ultimate aim of achieving close to zero concentrations of man-made synthetic substances in the marine environment.

However, since 1998 WWF has become concerned about the weakness of proposed action to reduce and eliminate discharges, emissions and losses of the OSPAR Chemicals for Priority Action.

References / Further Reading

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