

# Cetylpyridinium (hexadecylpyridinium chloride)

General sectors: Industry and commercial products, personal care product, legacy biocide

(CAS numbers: e.g. 123-03-5, EC number: 204-593-9

/ Entry number in HELCOM list of substances of concern: 8)

DRIVERS

ACTIVITIES

PRESSURES

STATE

IMPACTS

## Why a HELCOM concern?

### Main evidence

**S** Concentrations of a substance tentatively identified as Cetylpyridinium exceed the applied threshold value in **12** of the 16 examined areas (assessment units) of the Baltic Sea. The threshold is exceeded in both coastal and off-shore areas (**1/1** assessed off-shore areas). In these 12 areas, on average **92%** of the assessable samples in **sediment and/or biota** exceed the threshold value. This is based on suspect screening data from the project PreEMPT<sup>1</sup>. A total number of 67 data points were possible to evaluate for this substance.

By further considering how much above or below the threshold each concentration is, and how often the substance is detected, Cetylpyridinium scores **7.8/10** (confidence range: **4.5 – 8.3**) in the scale established when assessing the criticality/significance of current levels in the Baltic Sea pose, where 5 indicates concern and 10 extreme risk, and the range reflects the level of reliability and representativeness of concentrations and the thresholds.

The threshold value for Cetylpyridinium, in biota, was acquired from the NORMAN Network ecotoxicology database<sup>2</sup>.

**I** Current levels in the Baltic Sea indicate potential negative impacts on pelagic biota and/or top predators such as mammals and birds.

### Supporting evidence

**P** Approximately **7 – 30 kg of Cetylpyridinium** are estimated to enter the Baltic Sea every year via Wastewater Treatment Plants (Undeman et al, 2022<sup>3</sup>). Additional inputs may be expected from riverine inputs beyond the contributing WWTP effluents. Given that the substance is **bioaccumulative and very toxic**<sup>4</sup>, current inputs are considered as possibly significant, in terms of risk they pose for the Baltic Sea and its ecosystem services. As mentioned above, levels in Baltic Sea have already exceeded thresholds.

### Overall assessment

When assessing current levels in the Baltic Sea, current inputs, and the severity of the relevant toxicity mechanism, Cetylpyridinium scores **49-79/100** in the scale established for assessing the overall risk for impacts/threat for the Baltic Sea, where 50 indicates concern, 100 extreme risk, and the width of the span outlines the uncertainty in the assessment.

## Facts relevant for management considerations

### Causal chain and pathways

**A** The EU REACH registered volume for Cetylpyridinium is 100 - 1,000 t/y<sup>5</sup>. Registered uses include as co-formulant in agrochemical products and in powder and liquid application by consumers ('down-the-drain cosmetic products')<sup>6</sup>. The substance is also authorised in the EU for use in personal care products, such as antimicrobial, antistatic, deodorant, hair conditioning, oral care, surfactant-cleansing, and surfactant-emulsifying.

**S ?** *In order to further improve the evaluation of the risk, the first aspect to consider is identity confirmation (PreEMPT samples). If identity is confirmed, then a further aspect to consider is a review of the relevant toxicity thresholds (sediment, biota).*

### Relevant policies (existing or planned measures)

**M**

## References:

1. 2. 3. 4. 5. 6.

[Note: Listing of detailed references will be provided in an upcoming update of the fact sheet – for a listing of the most common references among the different substances see the section at the end of the consolidated document which includes all the fact sheets]