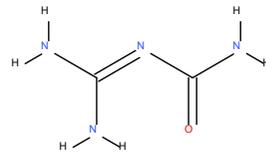




Guanylurea

Guanylurea is a stable transformation product of Metformin, a medication for the treatment of type 2 diabetes. Both are present in wastewater treatment plant effluents and regularly detected in surface waters. It is a very small and polar molecule.

mass:
102,10
g/mol
CAS:
141-83-3
C₂H₆N₄O



The LANUV measurements meet the following criteria necessary for clear identification:

- 1) match of the exact mass, ± 5 ppm
- 2) match of the isotope pattern, min. 70 %
- 3) match of a reference spectrum
- 4) match of retention time

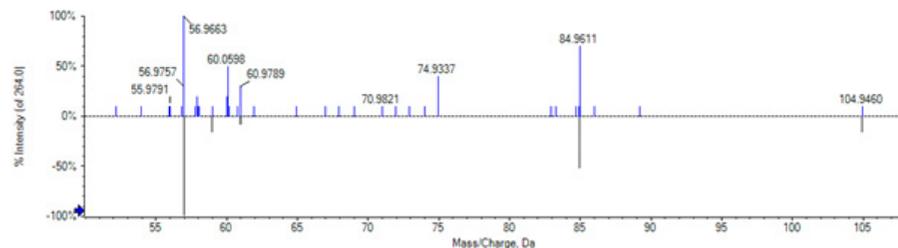


Figure 1: comparison of fragment-ion-spectra, blue: sample Ruhr near Mülheim, gray: reference substance

¹ <https://www.umweltbundesamt.de/themen/wasser/trinkwasser/trinkwasserqualitaet/toxikologie-des-trinkwassers/gesundheitslicher-orientierungswert-gow>

Analysis and occurrence

There are not many data available for Guanylurea. An assessment is difficult because the analysis is not optimized for this substance. In order to obtain reliable data it is questionable whether this is necessary and useful to optimize the measuring method for Guanylurea.

It was found in all the investigated rivers (Rhine, Ruhr, Ems and Lippe) therefore it belongs to the ubiquitous substances. The general precautionary value of 0.1 $\mu\text{g/L}$ is regularly exceeded. The estimated concentration are between 0.2 up to a lower double-digit range $\mu\text{g/L}$.

Relevance

Due to the substance properties (hydrophilic, low bioaccumulation potential, low adsorption tendency to particles), guanylurea is classified as potentially relevant to drinking water based on the available data. In 2015 the UBA set an GOW of 1.0 $\mu\text{g/L}$ ¹.

There are not many ecotoxicological data for guanylurea available. In 2020 the UBA set a provisional AA-QS of 100 $\mu\text{g/L}$ for freshwater based on chronic fish test².

Further procedure:

Guanylurea belongs to the ubiquitous substances and occurs repeatedly in comparable concentrations. By further measurements, no gain in knowledge is expected. Therefore, guanylurea is not included in the regular monitoring, even if the precautionary value of 0.1 $\mu\text{g/L}$ is exceeded.

² https://www.umweltbundesamt.de/sites/default/files/medien/5750/publikation/en/2020_12_09_texte_233-2020_umweltqualitaetsnormen_binnengewasser.pdf