Non Target – News #22

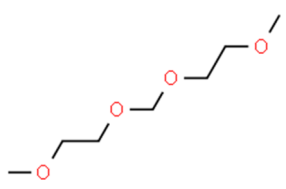
Landesamt für Natur,
Umwelt und Verbraucherschutz
Nordrhein-Westfalen

Bis(2-methoxyethoxy)methane

Molar mass:
164.20 g/mol

CAS: 4431-83-8

$C_7H_{16}O_4$



Bis(2-methoxyethoxy)methane (or. 2,5,7,10-Tetraoxaundecan) is mainly used as a solvent and can be a component of various products, such as antifreeze products, coating products, fillers or lubricants. It is used by consumers, professional workers or at industrial sites. In the European Economic Area Bis(2-methoxyethoxy)methane is produced and/or imported in quantities of 100 to 1000 tonnes per year and is registered under the REACH regulation.[1]

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

1) Match of a reference spectrum
2) Match of the retention time with the reference substance

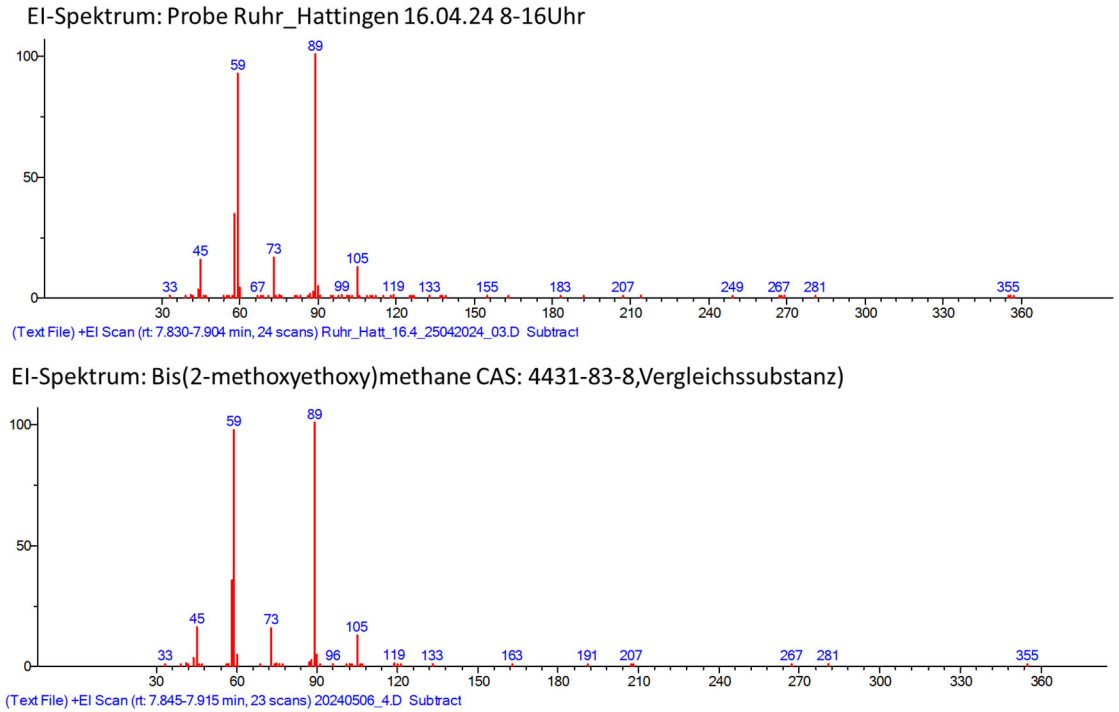


Figure 1: comparison of fragment-ion-spectra, top: sample from the Ruhr near Hattingen 16.04.24 8 a.m. to 4 p.m., bottom: reference substance

[1]ECHA: 2,5,7,10-tetraoxaundecane https://echa.europa.eu/de/substance-information/-/substanceinfo/100.022.393; accessed on 29.10.2024

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Analytics and occurrence

As part of the intensified water monitoring (INGO; *intensivierte Gewässer-überwachung*), an unknown substance has been measured in the Ruhr near Hattingen since 16 April 2024. Detection was carried out using SPE-GC-MS. The concentrations were estimated using the internal standard 1,4-dichlorobenzene previous to the identification.

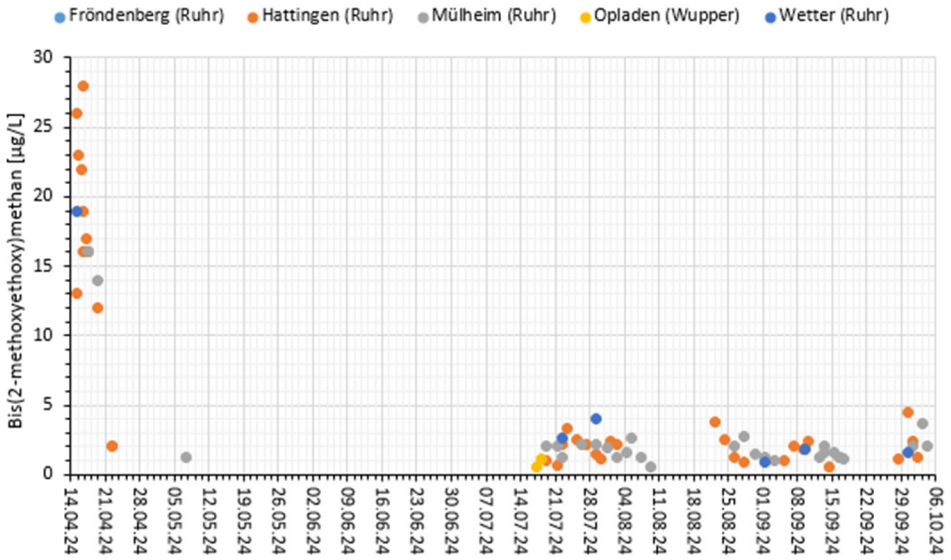

Figure 2: Concentrations for Bis(2-methoxyethoxy)methane from LANUVs intensified water monitoring (INGO)

The maximum concentration of 28 µg/L was obtained in the composite sample (16.04.24, 8 a.m. to 4 p.m.) from Hattingen. In Mülheim an der Ruhr, a maximum value of 16 µg/L was measured in the sample from 17.04.24 at 12:40. All samples from Fröndenberg showed no findings. The general prevention value of 0.1 µg/L is repeatedly exceeded in the river Ruhr.

The initially unknown substance was subsequently identified as Bis(2-methoxyethoxy)methane through further research and analytic using GC-EI-MS and HPLC-HRMS. The substance has been included in the calibration of the intensified water monitoring (INGO) in the concentration range of 0.5 to 4.5 µg/L since July 2024.

Relevance

An acute data set for Bis(2-methoxyethoxy)methane is available in the European Chemicals Agency (ECHA) database on ecotoxicology. The results show no acute toxicity for algae, water fleas and fish up to the three-digit mg/L range. Results from chronic ecotoxicological tests are not available. The environmental fate test results available from ECHA indicate that the substance is not readily biodegradable. A high bioaccumulation potential is not expected.

There are no legally binding limit values for Bis(2-methoxyethoxy)methane for drinking water. The general prevention value of 0.1 µg/L is therefore used for the assessment of drinking water production. Due to its substance properties (very mobile, not easily biodegradable, remains in the water phase, low bioaccumulation potential), the substance is to be classified as potentially relevant to drinking water based on the data available to date. Data on the behaviour of the substance in drinking water treatment are not available.[2]

[2]ECHA: 2,5,7,10-tetraoxaundecane https://echa.europa.eu/de/registration-dossier/-/registered-dossier/10866/5/5/2; accessed on 29.10.2024

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Further procedure:

The responsible water authorities, the local water suppliers and downstream users (Netherlands) will be informed about current findings from the intensified water monitoring (INGO) via the "*Warn- und Informationsdienst Ruhr (WIP)*". The wastewater discharges in the affected sections of the river Ruhr will be temporarily monitored for Bis(2-methoxyethoxy)methane in order to identify the polluter(s).