

## Data Ion Chromatography Analysis

Object / Record : 2024 (KN&V)

Artist : Bernard Heesen (uitvoerder Ajeto - Lasvit CzR)

Title and date : Encyclopedisch gewrocht - 1998

Conservator : Mandy Slager



### General condition

Date: 16/09/2020

2013: slecht, glasziekte, voelt zepig aan, no images were taken by the Visual Art Box. 2013: cleaned (deminerIALIZED water and :ethanol (4:1)).  
 2020: 17 sept: samples taken for IC analysis by G. Verhaar and M. Slager/UvA students. Object voelt glibberig aan, de meer witte delen zijn glibberiger dan de delen met transparant glas. De appliques voelen glibberiger aan dan de rest van het object. Condition red = very poor.  
 2023: b.5 dust on the surface (top exterior and protruding appliques), c.2 slippery (on more intens white parts only, not at the bottom).

Very poor

### Examination and analysis

Date: 01/08/2023

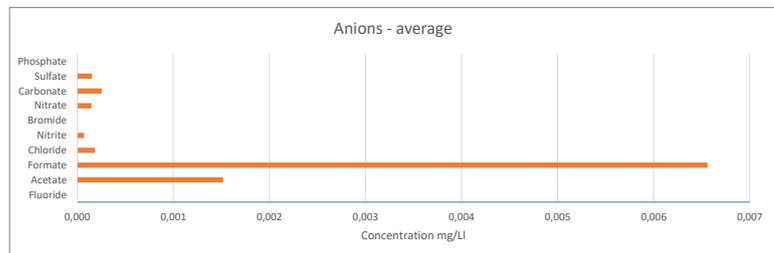
Analysis september 2020: samples were taken from the exterior surface of the object for analysis by means of Ion Chromatography by G. Verhaar. The results show relatively high concentrations of alkali ions. Also a relatively large peak for formate.

Likely unstable

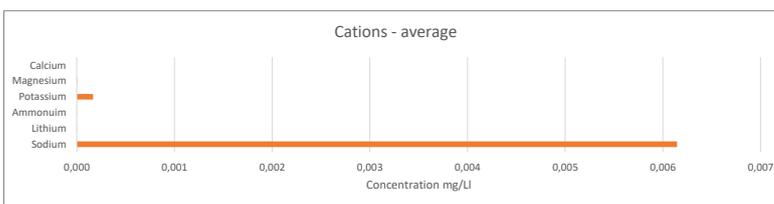
### Concentrations (mg/L)

Anions				
	U	Ave	SD	RSD
Fluoride	19,00	0,000	0,000	0,000
Acetate	60,05	1,519	1,412	0,930
Formate	45,02	6,562	7,977	1,216
Chloride	35,45	0,184	0,167	0,909
Nitrite	46,01	0,071	0,100	1,421
Bromide	111,96	0,000	0,000	0,000
Nitrate	62,01	0,147	0,100	0,681
Carbonate	60,01	0,255	0,328	1,284
Sulfate	96,06	0,152	0,061	0,402
Phosphate	94,97	0,006	0,012	2,000

### Graphs and/or Tables



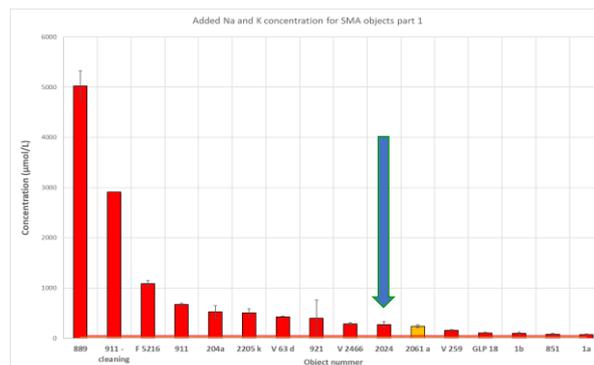
Cations				
	U	Ave	SD	RSD
Sodium	22,99	6,146	8,203	1,335
Lithium	6,94	0,001	0,002	1,572
Ammonium	18,04	0,002	0,002	1,091
Potassium	39,10	0,168	0,163	0,971
Magnesium	24,31	0,003	0,003	0,916
Calcium	40,08	0,000	0,000	0,000



### Added Na and K concentrations

Sodium	22,99	267,336
Potassium	39,10	4,297
Total	µmol/L	271,633

Likely unstable



Categorisation total alkali ion concentration	µmol/L
IC-A	Likely stable < 20
IC-B	potentially unstable >20 <50
IC-C	likely unstable > 50

### Intepretation, questions and comments on results

The object was diagnosed with slipperiness and subsequently cleaned in 2013. But in 2020 and 2023 the object was diagnosed again as being slippery. It is not clear if the object had developed the slippery layer within a short period after the cleaning treatment or had developed slowly over the past 10 years. The extend of slipperiness is also something that we can not determine. No images were taken by The Visual Art Box in 2013. Both in 2020 and in 2023 the slippery areas are noticed on the more intens white areas, that are not covered with a layer of transparant glass. In 2020 it is mentioned that the more intens areas are MORe slippery, but in 2023 it seems that only the more intens areas are slippery.

The results from the IC analysis show relatively high concentrations of Sodium. The high concentration of Sodium is in line with the characteristics noticed during visual examination.

In the two top graphs with representation of avarage concentrations of anions and cations, the standard deviation can be drawn from the raw data in the left tables, but is not inserted in the graphs. They are included in the last graph. In the bottom graph the LOQ line and red line indicate that this object falls within the IC-C category. The red colour of the bar indicates that the condition was assessed as being very poor during visual examination prior to sample taking. It shows that the signs visually noticed were in line with the IC results.

Not detected: F-, NO<sub>2</sub>-, Br-, NO<sub>3</sub>-, PO<sub>4</sub><sup>3-</sup>, Li+, NH<sub>4</sub><sup>+</sup>, Mg<sup>2+</sup>. Sodium concentration is dominant compared to the concentration of Potassium. One species being dominant is usually the case when both species are present in unstable glass.

### Suggestions further examination or analysis

\* More information about the manufacturing process (artist interview) and comparison with possible similar objects in other collections

\* Compositional analysis (XRF or other) to be able to combine data from visual examination with IC data and composition informatipon for even deeper understanding of condition.