Electronic Supplementary Material (ESI) for Analytical Methods.

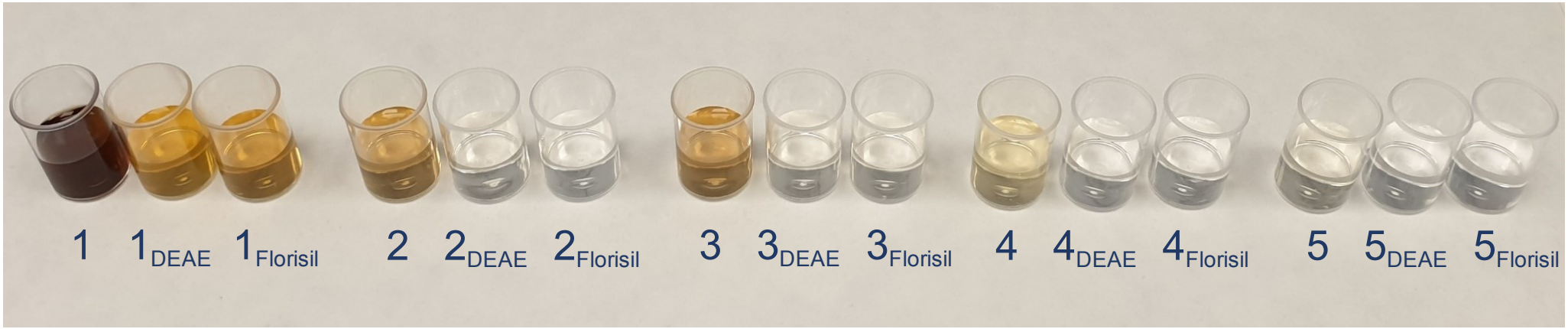

Fig. 1S. Visible decolourisation of wastewater samples using DEAE or Florisil columns.

1- Municipal landfill leachate (I)
2- Municipal landfill leachate (II)
3- Municipal landfill leachate (III)
4- Landfill leachate from disposal of leather waste
5- Landfill leachate from organic acid production

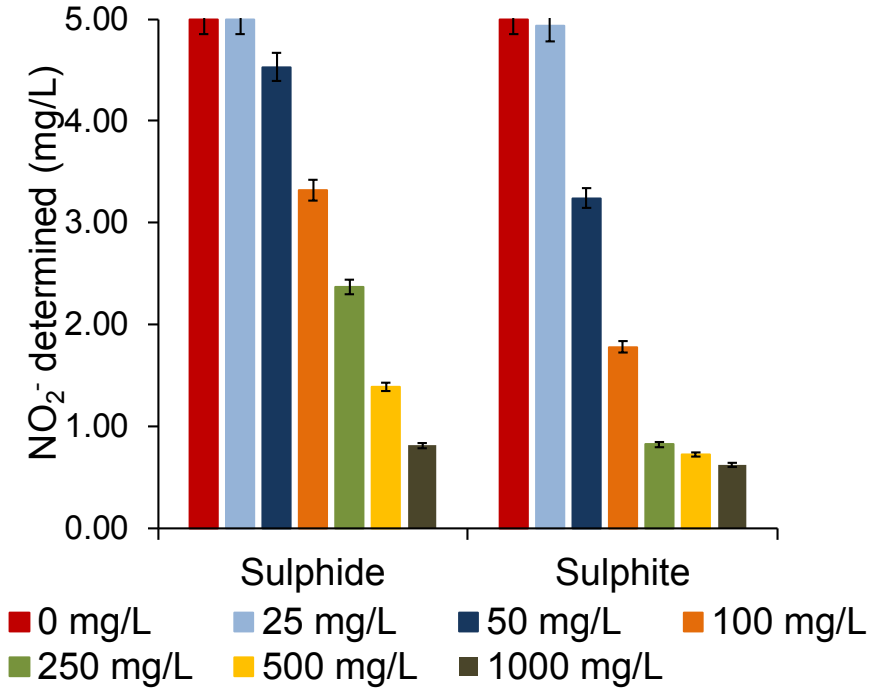

Fig. 2S. Influence of different concentrations of sulphide and sulphite on the spectrophotometric determination of nitrite.

Table 1S
Analytical parameters for the spectrophotometric determination of ammonium, nitrate, chloride, sulphate, fluoride and phosphate using Hach cuvette tests.

Analyte	Cuvette test	Method	Measuring range (mg/L)	Sample volume (mL)	Reaction Time (min)	Detection (nm)
NH_4^+	LCK 302 LCK 304	Indophenol blue	60-167 0.02-2.5	0.2 5	15	550
NO_3^-	LCK 339	2.6-Dimethylphenol	1-60	1	15	345
Cl^-	LCK 311	Iron(III)-thiocyanate	1-70 70-1000	1 0.1	3	468
SO_4^{2-}	LCK 153	Barium sulphate	40-150	5	2	430
F^-	LCK 323	SPADNS	0.1-2.5	3	1	588
PO_4^{3-}	LCK 348	Phosphormolybdenum blue	1.5-15	0.5	10	880

Table 2S
Concentrations of ammonium, nitrate, sulphate, chloride, fluoride and phosphate in the certified reference materials CRM Ammonia – WS and CRM Anions – Whole Volume determined by spectrophotometry using cuvette tests. The results represent the mean concentration obtained for three parallel samples.

Analyte	CRM Ammonia – WS		CRM Anions – Whole Volume	
	Determined (mg/L)	Certified (mg/L)	Determined (mg/L)	Certified (mg/L)
NH_4^+	0.416±0.004	0.408±0.051	/	/
NO_3^-	/	/	49.9±0.4	49.6±0.88
SO_4^{2-}	/	/	45.6±0.3	44.3±0.791
Cl^-	/	/	90.6±0.7	95.0±1.7
F^-	/	/	1.15±0.02	1.17±0.0206
PO_4^{3-}	/	/	9.51±0.05	9.48±0.17

Table 3S
Linearity, LODs, LOQs and repeatability of measurement for the determination of ammonium, nitrate, chloride, sulphate, fluoride and phosphate in aqueous solutions by spectrophotometry using cuvette tests.

Analyte	Cuvette test	Linear measuring range (mg/L)	LOD (mg/L)	LOQ (mg/L)	Concentration for testing repeatability (mg/L)	Repeatability RSD (%)
NH_4^+	LCK 302	5-200	0.94	3.12	100	0.5
	LCK 304	0.02-2.5	0.007	0.024	1	0.3
NO_3^-	LCK 339	1.2-60	0.35	1.15	50.0	0.7
Cl^-	LCK 311	3-1000	0.68	2.27	90.5	0.7
SO_4^{2-}	LCK 153	15-150	0.99	3.30	45.5	0.5
F^-	LCK 323	0.4-2.5	0.11	0.37	1.15	1.8
PO_4^{3-}	LCK 348	0.5-15	0.14	0.46	9.5	0.6

Table 4S
Intrinsic absorbances of wastewater samples and absorbances of wastewater samples after colour removal using DEAE and Florisil columns.

Analyte/ Column	Detection (nm)		Sample No. 1 (AU)	Sample No. 2 (AU)	Sample No. 3 (AU)	Sample No. 4 (AU)	Sample No. 5 (AU)
NH_4^+ DEAE	550	Sample	1.31	0.164	0.235	0.069	0.047
		Decolourized sample	0.487	0.046	0.040	0.055	0.040
NO_3^- Florisil	345	Sample	10	1.50	2.15	0.776	0.334
		Decolourized sample	3.96	0.934	1.14	0.623	0.236
Cl^- Florisil	468	Sample	2.48	0.296	0.453	0.123	0.069
		Decolourized sample	0.703	0.199	0.194	0.097	0.080
SO_4^{2-} Florisil	430	Sample	3.55	0.445	0.671	0.186	0.096
		Decolourized sample	1.18	0.283	0.301	0.149	0.097
F^- Florisil	588	Sample	1.02	0.129	0.178	0.059	0.043
		Decolourized sample	0.214	0.104	0.080	0.050	0.059
PO_4^{3-} Florisil	880	Sample	0.283	0.066	0.066	0.061	0.058
		Decolourized sample	0.072	0.077	0.060	0.062	0.066

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Table 5S
Main physicochemical characteristics of investigated wastewater samples.

Sample No.	pH	Electrical conductivity (mS/cm)	Colour	Total carbon (mg/L)	Total inorganic carbon (mg/L)	Total organic carbon (mg/L)	S^{2-} (mg/L)	SO_3^{2-} (mg/L)
1	7.2	24	Dark brown	587	194	393	130	18
2	7.1	5.2	Brown	270	193	77	80	2.3
3	7.0	4.3	Brown	242	184	58	85	2.4
4	4.4	3.5	Yellow	144	<10	144	70	1.5
5	6.9	3.3	Light yellow	158	119	39	75	2.4

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Table 6S

Total element concentrations in wastewater samples determined by ICP-MS. Measurement uncertainty is better than ± 2%.

Element	Sample No. 1 (mg/L)	Sample No. 2 (mg/L)	Sample No. 3 (mg/L)	Sample No. 4 (mg/L)	Sample No. 5 (mg/L)
As	0.037	0.008	0.010	0.0047	0.021
Ba	0.88	0.39	0.36	0.25	0.27
Cd	0.0009	0.0008	0.0007	0.0009	0.0005
Cr	0.62	0.094	0.100	0.39	0.053
Cu	0.027	0.026	0.040	0.035	0.007
Hg	0.0011	0.0010	0.0009	0.0011	0.0008
Mo	0.0023	0.0009	0.0009	0.0009	0.0008
Ni	0.22	0.074	0.072	0.047	0.061
Pb	0.005	0.004	0.005	0.0013	0.006
Sb	0.006	0.003	0.003	0.0012	0.001
Se	0.004	0.003	0.002	0.0043	0.002
Zn	0.20	0.18	0.22	0.083	0.06
Fe	2.8	1.3	1.4	2.6	5.6
Mn	0.68	0.23	0.22	0.29	2.1
Ca	261	95	128	109	630
Mg	129	64	71	57	22.0
Na	410	226	387	386	26.0
K	1415	361	313	240	76

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Table 7S
Repeatability of measurements for the determination of ammonium, nitrate, chloride, sulphate, fluoride and phosphate after decolourization and interferences removal in wastewater sample No. 4.

Analyte/ Replicate measurement	NH_4^+ (mg/L)	NO_3^- (mg/L)	Cl^- (mg/L)	SO_4^{2-} (mg/L)	F^- (mg/L)	PO_4^{3-} (mg/L)
1	115	40.0	160	416	1.06	4.44
2	110	40.0	160	412	1.13	4.49
3	111	40.3	159	416	1.21	4.44
4	112	40.0	160	412	1.18	4.49
5	113	40.8	163	412	1.19	4.41
6	116	40.3	162	415	1.21	4.38
Average (mg/L)	113	40.0	161	414	1.16	4.44
Standard deviation (mg/L)	2.3	0.3	1.6	2.0	0.06	0.04
RSD (%)	2.1	0.8	0.9	0.5	5.0	1.0