ODS specialist in Samplers & Analytical Systems

Sum-parameter analysis methods for Waste Water; Carbon, Nitrogen and Oxygen Demand analysis methods

Measurement Response comparison

		Biochemical Oxygen Demand (BOD)	Chemical Oxygen Demand (COD)	Kjeldahl Nitrogen ($N_{kjeldahl}$)	Fast Cascade Biochemical Oxygen Demand	Total Oxygen Demand (TOD)	Total Carbon (TC)	Total Organic Carbon (TOC) direct method	Total Organic Carbon (TOC) differential method	Total Nitrogen Bounded (TNb)
	Analysis Technique	Titrametric determination of O_2-consumption due to biological oxidation of sample	Determination of oxidant consumption during chromic acid digestion of sample	Determination of nitrogen via digestion forming ammonium sulphate, distillation and titration	Determination of the difference in O_2-consumption due to biological oxidation in two parallel cascade systems	Determination of O_2- consumption during thermal combustion of sample	Determination of total carbon content by thermal combustion and analysis of resulting CO_2	Determination of non purgeble organic carbon content by thermal combustion, CO_2 analysis with removal of inorganic carbons compounds	Determination of organic carbon content by thermal combustion, CO_2-analysis with correction of inorganic carbons compounds	Determination of total nitrogen content by thermal combustion and analysis of resulting NO_x (NO and NO_2)
	Reagents Required	Neutralisation buffer, biological seed and Winkler titration reagents	Chromic acid, mercuric sulphate, sulphuric acid, titration reagents	Potassium sulphate, catalysts, boric acid, sodium carbonate, methyl orange pH indicator	Fresh seed from the WWTP (active sludge)	None	None	Acid, typically hydrochloric	Acid, typically phosphoric	None
	LAR Analyser Model	Laboratory method	Laboratory method	Laboratory method	Biomonitor	Quick-COD-o	Quick-TOC TC-only	Quick-TOC-direct	Quick-TOC-differential	Quick-TNb
										
	Time per Analyses	5 to 20 days	2 hours std	2 hours std	Typ. 30 minutes	3 minutes	3 minutes	5 minutes	6 minutes	3 minutes
	Normal Repeatability	+/- 10%	+/- 8%	+/- 10%	+/- 10%	+/- 3 %	+/- 2 %	+/- 2%	+/- 2%	+/- 3 %
	Recovery (% oxidation)	30%	90%	90%	30%	99%	100%	100%	100%	95%
	Minimum detectable (mg/l.)	-	-	-	1 mg/l. -O_2	3 mg/l. -O_2	< 0,1 mg/l.C	< 0,1 mg/l.C	< 0,1 mg/l.C	< 1 mg/l.N
	Maximum range (mg/l.)	-	-	-	200000 mg/l. -O_2	50000 mg/l.-O_2	100000 mg/l.C	100000 mg/l.C	100000 mg/l.C	10000 mg/l.N
	Rangeability	-	-	-	1:100	1:50	1:1000	1:1000	1:1000	1:50
Organic Compounds	Biodegradable	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No
	Suspended Solids	Partial	Partial	No	Partial	Yes < 2 mm	Yes < 2 mm	Yes < 2 mm	Yes < 2 mm	No
	Particulate (POC) *(3)*	Partial	Partial	No	Partial	Yes < 2 mm	Yes < 2 mm	Yes < 2 mm	Yes < 2 mm	No
	Dissolved (DOC)	No	Yes	No	No	Yes	Yes	Yes	Yes	No
	Purgable (POC) *(3)*	Yes	Partial	Yes	Yes	Yes	Yes	Partial	Yes	No
	Volatile (VOC)	Partial	Yes	No	Yes	Yes	Yes	Partial	Yes	No
	Organic Sulphur ($C_xH_yS_z$)	Yes	Yes	No	Yes	Yes	Yes Organic portion	Yes Organic portion	Yes Organic portion	No
	Organic Nitrogen ($C_xH_yN_z$)	Yes	Partial	Yes	No	Yes	Yes Organic portion	Yes Organic portion	Yes Organic portion	Yes Nitrogen portion
Nitrogen Compounds	Ammonium (NH_4^-)	Partial	No	Yes	Partial	Yes	No	No	No	Yes
	Nitrite (NO_2^-)	Partial	No	No	Partial	No	No	No	No	Yes
	Nitrate (NO_3^-)	No	Yes	No	No	Interference Reduces TOD	No	No	No	Yes
	Ammonium Nitrogen (NH_3+NH_4^-)	Partial	No	Yes	Partial	yes	No	No	No	Yes
	Particulate Nitrogen	No	No	Partial	No	yes	-	-	-	Yes
Other Chemical Compounds	Inorganic Carbon (IC)	No	No	No	No	No	Yes	No	Yes	No
	Sulphide (S^{2-})	Yes	Yes	No	Yes	Yes	No	No	No	No
	Sulphite (SO_3^{2-})	Yes	Yes	No	Yes	Yes	No	No	No	No
	Sulphate (SO_4^{2-})	No	No	No	No	Interference *(1)*	No	No	No	No
	Chloride (Cl^-)	No	No *(2)*	No	No	No	No	No	No	No
	Phosphate (PO_4^{3-})	No	No	No	No	No	No	No	No	No
Special Compounds	Toxic compounds	Reduces BOD	No	No	Reduces BOD	No	No	No	No	No
	Salt / brine (NaCl)	-	Interference	-	-	No *(4)*	No	No	No	No
	Nitric Acid (HNO_3)	No	No	No	No	Interference Reduces TOD	No	No	No	No

Remarks:
(1) Sulphate reduces the TOD results if the sample is acid.
(2) Chloride increases TOD results above 2000 ppm chloride.
(3) The abbreviation POC is used for both, Purgeble Organic Carbon and Particulate Organic Carbon. Analytically there is a big difference.
(4) Salts > 5 gram effects TOD-results (base line shifting) below 1000 mg/litre -O2

Specifications are subject to change by manufacturer or ODS without notice due to modifications or improvements

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