Total aldehydes

Method: Hydrazine in 0.1 M citrate buffer, pH 6.5
Technique: Differential Pulse Voltammetry (DPV/a)

Start Potential (mV)	**-1000**
End Potential (mV)	**-1350**
Current range	**2.048 µA**
Scan Speed (mV/s)	**3**
Number of cycles	**5**
Delay before sweep (s)	**10**
Purge and stir time (s)	**300**
Stirring speed (rpm)	**60**
Drop Size (a.u.)	**60**

Use this procedure for the analysis of formaldehydes and total aldehydes. The first shows a peak potential at about -970 mV, while the latter appear like a unique peak at about –1150 mV. Total aldehydes are analysed by using acetaldehyde as reference standard.

Total aldehyde concentrated standard solution (1 g/l)
Dissolve 1 g of pure acetaldehyde in 1 l of distilled water in a volumetric flask.
Prepare fresh solution at the moment of analysis.

Supporting Electrolyte
1- 1 M ammonium citrate buffer at pH 6.5. Dissolve 21 g of mono hydrate citric acid in 80 of distilled water. Adjust pH to 6.5 by using conc. NH_3. Bring to the mark in a 100 ml volumetric flask with distilled water.
2- 1% Hydrazine sulphate aqueous solution. Prepare fresh solution at the moment of analysis

Procedure
Pour 10 ml of sample in the cell, add 1 ml of ammonium citrate buffer. Deaerate for 10 min. Add 1 ml of hydrazine solution.

Working standard solution (10 mg/l)
Dilute the concentrated standard solution 1+99 in, at the moment of the analysis.

Interference
High concentration of formaldehydes can mask the peak of the total aldehydes.

Alternative supporting electrolytes
0.1 M ammonium phosphate buffer, pH 6.5

Analysis of total aldehydes in the air

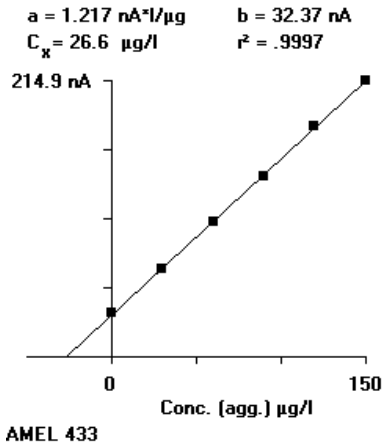
Sample the air in a bubbler filled with in 25 ml of 0.1 M citrate buffer solution for 1 – 2 hour using a pump, with a flow of 1 ml/ min.

Pour the solution in a 25 ml volumetric flask and bring to volume with 0.1 M citrate buffer slution.

Use 10 ml of his solution for the voltammetric analysis.

Analytical report

Analysis: Air of the lab
Sample (solution) Concentration = 27 µg/l
Sample (air) Concentration = 8 µg/m^3
Method: 5 addition and blank subtraction



Volumes Table

Solvent Volume	0 (ml)
Supporting Sol.	1 (ml)
Sample Volume	10 (ml)
Standard Conc.	10000 (µg/l)

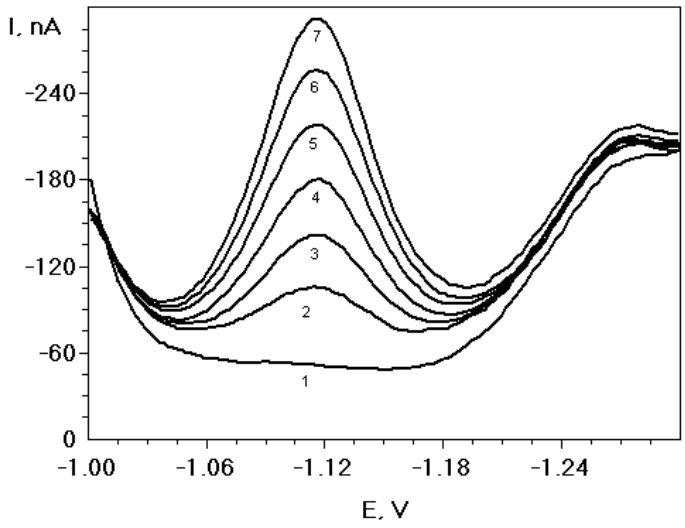
Height Table

#	Peak Pot.	Height
0	-1115.6	30.36 nA
1	-1113.3	61.55 nA
2	-1115.6	95.35 nA
3	-1116.5	126.7 nA
4	-1114.2	161.6 nA
5	-1115.6	192.7 nA

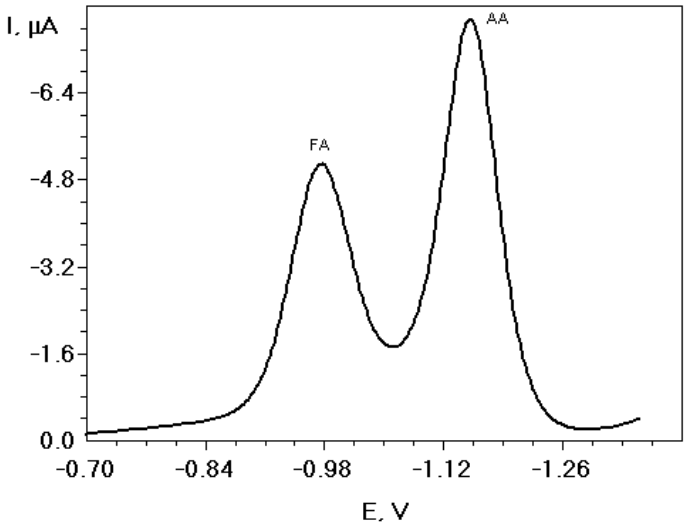
Regression Data

#	Add.Conc.	Height x dilution
0	0 µg/l	33.40 nA
1	30.0 "	67.90 nA
2	60.0 "	105.5 nA
3	90.0 "	140.5 nA
4	120 "	179.7 nA
5	150 "	214.9 nA

y = ax + b
a = 1.217 nA*l/µg
b = 32.37 nA
r^2= .9997



1= Blank; 2= Sample; 3, 4, 5, 6, 7 = standard sol. additions



The procedure can be used also for the analysis of formaldehyde, even if the other total aldehydes have to be present at low concentration.
FA = formaldehyde; AA= Acetaldehyde (total aldehydes)