

CHAPTER 3
METHODOLOGY

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There are quite a number of methods have been used for the determination of the concentrations of the trace metals, such as cadmium, lead, zinc, tellurium and the others.

The following Table 3.0 is shown a few methods for the trace metals analysis as below:

Table 3.0: The electrochemical methods have used for the trace metals analysis.

No.	Title	Mode	Detection limit	Reference
1.	Metal complexes of 1,4-benzo diazepines. III. Polarographic determination of zinc in presence of bromazepam.	DPP	Not reported	58
2.	Differential pulse polarographic determination of nickel(II), zinc(II), cobalt(II) and manganese(II) in a 2-amino-2-methylpropionic acid-thiocyanate mixed system.	DPP	Ni-0.07 µg/mL Zn -0.03µg/mL Co-0.20 µg/mL Mn-0.02µg/mL	59
3.	Determination of trace lead in high-purity cadmium sulphate by differential anodic-stripping voltammetry.	DPSV	Not reported	60
4.	Polarographic determination of metallic impurities on lapped silicon wafers.	DPP	Not reported	61
5.	Determination of traces of tellurium.	DPP	Te- 2 ppb	62
6.	Determination of lead in wine at sub-ppm levels using stripping voltammetry.	ASV	Not reported	63
7.	Determination of the labile species of zinc by anodic stripping staircase voltammetry, with special reference to correlation with the toxicity to <i>Tetrahymena</i> .	ASV	Not reported	64

No.	Title	Mode	Detection limit	Reference
8.	Simultaneous determination of copper, zinc, cadmium and lead in dietetic foods by differential pulse polarography.	DPP	Cd- 0.45 μ M Cu- 1.5 μ M Pb- 0.3 μ M Zn- 15.6 μ M	65
9.	Determination of copper, palladium and zinc by differential pulse polarography.	DPP	Pd, Zn and Cu are 0.1 μ g.	66
10.	Simultaneous determination of trace cadmium and indium by catalytic polarography.	Catalytic polarography	Cd – 3nM In – 1 nM	67
11.	Determination of heavy metals in real samples by anodic- stripping voltammetry with mercury micro-electrodes.	ASV	Not reported	68
12.	Trace analysis of vanadium as pentavalent vanadium using different pulse polarography with a coupled catalytic homogeneous reaction.	DPP	V ^V - 5 ng ml ⁻¹	69
13.	Anodic-stripping voltammetry at mercury "film" deposited on conductivity poly(3-methylthiophene) electrodes.	ASV	Pb-0.05 ppm	70
14.	Stripping potentiometry for organolead compounds: application to the determination of total lead in gasoline.	ASV	Pb-70 μ g/L	71
15.	Cathodic-stripping voltammetric determination of nickel, copper, lead and cadmium by using the adsorptive wave of their oxine complexes.	CSV	Ni-0.3 nM Cu-0.1 nM Pb-0.05 nM Cd-0.1 nM	72
16.	Polarographic determination of zinc(II) and gallium(III).	DPP	Not reported	73
17.	Signal enhancement of lead and thallium in inductively coupled plasma atomic-emission spectrometry using online anodic stripping voltammetry.	ASV	Th-4.5 μ g/mL Pb-7.9 μ g/mL	74
18.	Simultaneous determination of zinc, cadmium, lead and copper ions in river water by differential-pulse anodic-stripping voltammetry.	DPSV	Not reported	75

No.	Title	Mode	Detection limit	Reference
19.	Simultaneous determination of indium(III) and cadmium(II) by differential pulse polarography in the presence of poly β -cyclodextrin.	DPP	Not reported	76
20.	Differential-pulse-polarographic determination of copper and bismuth in various real samples after adsorption of their morpholine-4-carbodithioates on to a microcrystalline naphthalene or a morpholine-4-dithiocarbamate-cethyltrimethylammonium bromide-naphthalene adsorbent.	DPP	Cu-0.1 ppm Bi-0.05 ppm	77