

CONTENTS

PART I INTRODUCTION

Chapter 1	Introduction	3
Chapter 2	Parameters to be determined (industry wise)	8

PART II CHEMICAL ANALYSIS

Chapter 3	Equipments, Glassware & Chemicals Required for Chemical Analysis	29
Chapter 4	Water for Analytical Laboratory Use	41
Chapter 5	Sampling of Water for Chemical Analysis	44
Chapter 6	Sampling of Boiler Water	56
Chapter 7	Chemical Analysis – General Notes	60
Chapter 8	Expression of Results	61
Chapter 9	Preliminary Acid Digestion of the Sample	64
Chapter 10	Acidity	66
Chapter 11	Alkalinity	71
Chapter 12	Aluminium	80
Chapter 13	Arsenic	84
Chapter 14	Bio Chemical Oxygen Demand (BOD)	87
Chapter 15	Boron	99
Chapter 16	Cadmium	102
Chapter 17	Calcium	106
Chapter 18	Calcium Carbonate Stability Test	109

Chapter 19	Carbon dioxide (Free)	110
Chapter 20	Chemical Oxygen Demand (COD)	115
Chapter 21	Chloride	121
Chapter 22	Chlorine Demand	128
Chapter 23	Chromium	130
Chapter 24	Coagulant Demand	135
Chapter 25	Color	137
Chapter 26	Copper	139
Chapter 27	Cyanides (Total)	143
Chapter 28	Electrical Conductivity	147
Chapter 29	Equivalent Mineral Acidity (EMA)	149
Chapter 30	Fluoride	150
Chapter 31	Hardness (Total)	157
Chapter 32	Hydrazine	164
Chapter 33	Iodide	166
Chapter 34	Iron	169
	– Total	169
	– Ferrous	172
Chapter 35	Langelier Index, Ryznar Index and Puckorius Scaling Index	175
Chapter 36	Lead	181
Chapter 37	Magnesium	184
Chapter 38	Manganese	189
Chapter 39	Mercury	192
Chapter 40	Nickel	195
Chapter 41	Nitrate	198
Chapter 42	Nitrite	201
Chapter 43	Nitrogen (Ammonia)	205
Chapter 44	Nitrogen (Albuminoid)	209

Chapter 45	Nitrogen (Organic)	211
Chapter 46	Nitrogen (Total Kjeldahl)	212
Chapter 47	Odor	214
Chapter 48	Oil and Grease	216
Chapter 49	Oxygen (Dissolved)	218
Chapter 50	Particle Counting	225
Chapter 51	Permanganate Value (Oxygen absorbed / Tidy's test)	226
Chapter 52	Phenols	230
Chapter 53	Phosphate	234
Chapter 54	pH value	239
Chapter 55	Potassium	243
Chapter 56	Residual Chelant	244
Chapter 57	Residual Chlorine	248
Chapter 58	Residual Sodium Carbonate (RSC)	253
Chapter 59	Selenium	257
Chapter 60	Silica	260
Chapter 61	Silt Density Index	265
Chapter 62	Silver	267
Chapter 63	Sodium	269
	– Percent Sodium	270
	– Sodium Adsorption Ratio (SAR)	273
Chapter 64	Sodium Slip Determination	276
Chapter 65	Solids	278
	– Total Solids	279
	– Dissolved Solids	280
	– Suspended Solids	281

	– Settleable Solids	283
Chapter 66	Sulfate	285
Chapter 67	Sulfide	290
Chapter 68	Sulfite	293
Chapter 69	Surfactants (Anionic)	295
Chapter 70	Tannin & Lignin	297
Chapter 71	Temperature	299
Chapter 72	Turbidity	300
Chapter 73	Volatile Acids	303
Chapter 74	Zinc	308
Chapter 75	Probable Combinations (Checking the Correctness of Analysis)	313
Chapter 76	Determination of Steam Purity	327

PART III MICROBIOLOGICAL ANALYSIS

Chapter 77	Microbiological Analysis of Industrial Waters – An Introduction	333
Chapter 78	Equipment, Glassware and Other Items Required for Microbiological Analysis	339
Chapter 79	Laboratory Technics	349
Chapter 80	Preparation of Media and Reagents	355
Chapter 81	Sampling of Water for Microbiological Analysis	359
Chapter 82	Standard Plate Count (Total Bacterial Count)	363
Chapter 83	Coliform Bacteria (Total Coliforms)	368
Chapter 84	Fecal Coliforms (Escherichia Coli)	382
Chapter 85	Proteolytic Bacterial Count	387
Chapter 86	Lipolytic Bacterial Count	388
Chapter 87	Thermophilic Bacterial Count	389
Chapter 88	Gelatin Liquefying bacteria	390

Chapter 89	Iron Bacteria	391
Chapter 90	Sulfate-Reducing bacteria	393
Chapter 91	Sulfur-Oxidizing bacteria	395
Chapter 92	Yeast and Mould	397
Chapter 93	Slime-Forming Organisms	399

PART IV MICROSCOPICAL EXAMINATION

Chapter 94	Microscopical Examination	403
------------	---------------------------	-----

APPENDIX 409

INDEX 433

REFERENCES 441