LIST OF TABLES

		After Page No.
1.1	Data on bond distance (A^{o}) and angles (^{o}) of d-AHT	3
1.2	Distances between N-O atoms	3
1.3	Information about some physical properties of d-AHT	6
2.1	Magnification of objectives and eye-pieces used in C-Z VERTIVAL Microscope	17
5.1	Molar concentration of TA (d-tartaric acid) in distilled water at 35°C.	92
5.2	Molar concentration of FS (feed solution - ammonium chloride) in distilled water at 35°C.	94
5.3	Data on crystal morphology, gel pH, molar concentrations of TA for a fixed molar concentration of FS	107
5.4	Data on crystal morphology, gel pH, molar concentration of FS for a fixed molar concentration of TA	107
6.1	Crystal dimension along growth axis, morphology for varying concentrations of tartaric acid	114
6.2	Growth rate of needle-shaped crystals for different gel ages	117

6.3	Data on number density of d-AHT crystals and their weights for varying concentrations of FS and gel pH	119
7.1	Assay of Ammonium chloride, given by manufacturer, Sarabhai M. Chemicals, Baroda, India	130
7.2	Assay of d-tartaric acid given by manufacturer, Sarabhai M. Chemicals, Baroda, India	130
7.3	Percentage of d-AHT elements	131
7.4	Analysis of X-ray powder photograph	134
7.5	(a) Sketch of orthorhombic disphenoidal crystal with symbols of faces	153
	(b) Observed and calculated inter-facial angles	
7.6	(a) Sketch of sphenoidal crystal with symbols of faces	154
	(b) Observed and calculated inter-facial angles	
7.7	Readings of optical rotation for different concentrations of d-AHT aqueous solution	156
7.8	Characteristics of synthetic d-AHT crystals grown in silica gel	159

8.1	Shape cycle of etch pits produced by varying quantity of crystalline trichloroacetic acid in 100 c.c. of glacial acetic acid at 30°C on a cleavage surface of d-AHT	170
8.2	Schematic diagram of etch pits produced by formic acid at 30°C, on a cleavage surface of d-AHT	170
9.1	Information of different indenters used for hardness studies of materials	179
10.1	Logarithms of diagonal of vickers indentation mark measured along [001] direction and of corresponding applied load for different quenching temperatures (T_Q) on cleavage plane (010)	208
10.2	Logarithms of diagonals of vickers indentation mark measured normal to [001] i.e. along [100] direction and of corresponding applied load for different quenching temperatures (T_Q) on cleavage plane (010)	208
10.3	Logarithms of diagonals of knoop indentation mark having longer diagonal along [001] direction and of corresponding applied load for different quenching temperatures (T_Q) on cleavage plane (010).	208
10.4	Logarithms of average of two diagonals of vickers indentation mark and of corresponding applied load for different quenching temperatures (T_Q) on cleavage plane (010)	208

10.5	Logarithms of two diagonals of vickers indentation mark measured along [001] direction in case of cleavage (010) and m(110) plane and along 101 direction in the case of (111) plane and normal to it in all cases and logarithms of corresponding applied load at room temperature	208
10.6	Logarithms of diagonals of vickers indentation (average) and knoop indentation mark for different d-AHT planes and of corresponding applied load at room temperature	208
10.7	Slopes n_1, n_2 and constants a_1 and a_2 for two regions LLR and HLR of log p vs. log d graphs and also peak P_k at kink, for vickers indentations (where average of two diagonal lengths were taken) on d-AHT cleavage plane	213
10.8	Slopes n_1, n_2 and constants a_1 and a_2 for two regions LLR and HLR of log p vs. log d graphs and also peak P_k at kink, for knoop indentation on d-AHT cleavage plane	213
10.9	Slopes n_1, n_2 and constants a_1 and a_2 for two regions LLR and HLR of log p vs. log d graphs and also peak P_k at kink, for vickers indentation mark (where diagonal length of indentation mark measured along [001] direction)	213

10.10	Slopes n_1, n_2 and constants a_1 and a_2 for two regions LLR and HLR of log p vs. log d graphs and also peak P_k at kink, for vickers indentation mark (where diagonal length of indentation mark measured normal to [001] direction i.e. along [100] direction)	213
10.11	Slopes n_1, n_2 and constants a_1 and a_2 for two regions LLR and HLR of log p vs. log d graphs and also peak P_k at kink, for vickers (average of two diagonal lengths) and knoop indentation for different d-AHT planes	213
10.12	Slopes n_1, n_2 and constants a_1 and a_2 for two regions LLR and HLR of log p vs. log d graphs and also peak P_k at kink, for two diagonal lengths of vickers indentation for different d-AHT planes	213
11.1	Vickers hardness numbers (average) on d-AHT cleavage plane (010) for different quenching temperatures	226
11.2	Knoop hardness numbers along [001] on d-AHT cleavage plane (010) for different quenching temperature	226

11.3	Vickers hardness numbers along [001] direction on d-AHT cleavage plane (010) for different quenching temperatures	226
11.4	Vickers hardness numbers normal to [001] direction on d-AHT cleavage plane (010) for different quenching temperatures.	226
11.5	Hardness numbers (vickers and Knoop) on (010), (110) and (111) planes of d-AHT	226
11.6	Hardness numbers (Vickers in two normal directions) on (010), (110) and (111) planes of d-AHT	226
11.7	Variation of hardness number(average) in HLR on a d-AHT cleavage plane with quenching temperature	229
11.8	Percentage deviations of the constant c ($= \bar{H}T_Q^k$) from its mean value for different quenching temperature	231
11.9	Variation of vickers hardness number ($\bar{H}_v$) along different directions on a d-AHT cleavage plane with quenching temperatures (T_Q)	232

11.10	Comparison of values of vickers and knoop hardness numbers on different d-AHT planes at room temperature	232
12.1	Zero-sum method : Plots of log p vs. log d for room temperature for vickers indentation	238
12.2	Zero-sum method : Plots of log p vs. log d for room temperature for vickers (average length of diagonals) and knoop indentations	238
12.3	Statistical estimation : Plots of log p vs. log d for room temperature for vickers indentations	239
12.4	Statistical estimation : Plots of log p vs. log d for room temperature for vickers (average length of diagonals) and knoop indentations	239
12.5	Zero-sum method : Plots of log p vs. log d for different quenching temperatures for vickers indentation	240
12.6	Statistical estimation : Plots of log p vs. log d for different quenching temperatures for vickers indentation	240

12.7	Zero-sum method : Plots of log p vs. log d for different quenching temperatures for vickers (average length of two diagonals) and knoop indentations.	240
12.8	Statistical estimation : Plots of log p vs. log d for different quenching temperatures for vickers (average length of two diagonals) and knoop indentations	240
12.9	Calculated and observed slopes of straight line plots log $\bar{H}T_Q$ vs. log T_Q	240