

C O N T E N T S

	<u>Page</u>
Preface ...	1
 <u>Part I</u>	
Synthesis of lactic acid from acetaldehyde, carbon monoxide and water
Chapter 1. Introduction
Chapter 2. Thermodynamics of the Reaction ...	9
Chapter 3. Experimental Details	
1. Apparatus ...	17
2. Reactants ...	22
3. Catalysts ...	22
4. Experimental Procedure ...	23
5. Analysis of liquid products ...	26
Analysis of gaseous products ...	29
6. Calculations ...	29
Chapter 4. Synthesis of lactic acid in presence of nickel catalysts	
1. Introduction ...	31
2. Preparation of nickel catalysts ...	36
3. Tables showing the activity of nickel catalysts ...	42
4. Discussion ...	52

	<u>Page</u>
Chapter V Results of Experiments with nickel iodide-silica catalysts.	56
Tables showing results of experiments with nickel iodide- silica catalysts.	59
Discussion	70
Chapter VI Studies on	
(i) Catalyst activity	
(ii) The effect of Release Temp.	76
Tables showing the results of experiments.	78
Discussion	81
Chapter VII Synthesis of lactic acid in presence of cobalt iodide-silica catalysts.	
Introduction	84
Preparation of catalysts	86
Results of experiments	89
Tables showing the results of experiments.	92
Discussion	100
Chapter VIII Synthesis of lactic acid in presence of iron catalysts.	
Introduction	104

		<u>Page</u>
	Preparation of catalysts . . .	108
	Results of experiments. . . .	108
	Tables showing the results of experiments. . . .	112
	Discussion	120
Chapter IX	Mechanism of the Reaction	128
Chapter X	Studies on Catalytic Decomposition of Acetaldehyde, Carbon monoxide and lactic acid at high pressures	128
	Tables showing the results of experiments. . . .	130
	Discussion	136
Chapter XI	Bibliography	139

Part II

	Synthesis of formic acid from carbon monoxide and water. . . .	
Chapter I	Introduction	147
Chapter II	Thermodynamics of the Reaction	153
Chapter III	Experimental Details	
	Apparatus	156
	Reactants	158
	Preparation of catalysts	158
	Procedure	159

		<u>Page</u>
	Analysis of Products	160
	Calculations	162
Chapter IV	Results of experiments	164
	Tables showing the results of experiments.	167
	Discussion	175
	General Discussion	181
Chapter V	Mechanism of the Reaction	182
Chapter VI	Bibliography	183

Part III**Synthesis of Propionic acid from ethylene,
carbon monoxide and water**

Chapter I	Introduction	185
Chapter II	Thermodynamics of the Reaction	192
Chapter III	Experimental Details	
	Apparatus	193
	Reactants	193
	Preparation of catalysts	194
	Procedure	195
	Analysis of products	195
	Calculations	197
Chapter IV	Results of Experiments	199

		<u>Page</u>
	Tables showing the results of experiments. 202
	Discussion 210
Chapter V	Mechanism of the Reaction 215
Chapter VI	Bibliography 216
	Summary 217