

1. Factorial Design	3
1.1 Introduction	3
1.2. Basic Principals of Experimental Design	3
1.3. Terminology	6
1.4. Common Mistakes in Experimentation	8
1.5. Types of Experimental Design	8
1.5.1. Simple Design	9
1.5.2. Full Factorial Design	9
1.5.2.1. Allocation of Variation	15
1.5.3. 2kr Factorial Design With Replication	22
1.5.3.1. Allocation of variation	24
1.5.3.2. Confidence Intervals for Effects	26
1.5.3.3. Confidence Intervals for Predicted Responses	28
1.5.4. 2k.p Fractional Factorial Design	33
2. Second Order Experimental Designs	43
2.1. Box-Wilson Composite Designs (Central Composite Design)	44
2.2. Orthogonal Second-Order Designs ,	47
2.3. Rotatable Second.Order Designs ,	53
2.4. Symmetrical Composite Design Type Bk	59
2.5. Multi Response Optimizatiot ,	65
2.5.1. Harrington Desirability Function	65
2.5.2. Application of Statistical Designs and Response Surface Methodology	78
3. Applied Statistical Designs for Polymerization of Acrylamide	82
3.1. Introduction	82
3.2. Mathematical Models	82
3.2.1. Mathematical1 Models for Batch Polymerization	82
3.2.2. Mathematical Models For Polymerization in CSTR	85
References	93
Recommended Reading	95
Appendix	97