

# Contents

Abstract	
Souhrn	
List of the papers	7
Background	8
1 Polymeric materials	8
2 Introduction to molecular theories for polymer melts	11
2.1 Random walk model and Gaussian statistics	11
2.2 Bead-Spring type models	13
2.2.1 Dumbbell model	13
2.2.2 Rouse model	14
2.3 Network Theories	15
2.4 Reptation theory	17
3 Constitutive models	24
3.1 Doi-Edwards model	24
3.2 Pom-Pom model	25
3.3 eXtended Pom-Pom (XPP) model	28
3.4 PTT-XPP model	29
3.5 Modified Leonov model	30
4 Measurement methods used	31
Aims of Doctoral Thesis	34
Summaries of the papers	35
Conclusions	38
Acknowledgement	41
List of symbols	42
Reference	44
Curriculum Vitae	