

## Contents

1.	BASIC LAWS	-	-	-	-	-	-	-	1-1
2.	STRUCTURE OF ATOM	-	-	-	-	-	-	-	2-8
2.1	Basic description	-	-	-	-	-	-	-	2-8
2.2	Quantum mechanics point of view	-	-	-	-	-	-	-	2-12
2.3	The hydrogen atom	-	-	-	-	-	-	-	2-15
2.4	Electron configuration and periodic table of elements	-	-	-	-	-	-	-	2-21
2.5	Atom characteristics and properties	-	-	-	-	-	-	-	2-28
3.	CHEMICAL BONDS	-	-	-	-	-	-	-	3-36
3.1	Formation of molecules	-	-	-	-	-	-	-	3-36
3.2	Quantum mechanics point of view	-	-	-	-	-	-	-	3-46
3.3	Hybridization	-	-	-	-	-	-	-	3-50
3.4	Metallic bond	-	-	-	-	-	-	-	3-55
4.	STATES OF MATTER	-	-	-	-	-	-	-	4-57
4.1	Classifying matter	-	-	-	-	-	-	-	4-57
4.2	Composition of mixtures	-	-	-	-	-	-	-	4-59
4.3	The gaseous state	-	-	-	-	-	-	-	4-62
4.4	The liquid state	-	-	-	-	-	-	-	4-65
4.5	The solid state - crystals	-	-	-	-	-	-	-	4-72
4.6	The solid state - amorphous solids	-	-	-	-	-	-	-	4-78
5.	THERMODYNAMICS	-	-	-	-	-	-	-	5-80
5.1	The principal terms of thermodynamics	-	-	-	-	-	-	-	5-80
5.2	The first law of thermodynamics	-	-	-	-	-	-	-	5-82
5.3	The pressure - volume work	-	-	-	-	-	-	-	5-83
5.4	Heat	-	-	-	-	-	-	-	5-84
5.5	Thermochemistry	-	-	-	-	-	-	-	5-86
5.6	The Carnot cycle	-	-	-	-	-	-	-	5-89
5.7	Phase equilibria	-	-	-	-	-	-	-	5-93

Table of electron configurations  
of the elements  
List of symbols  
References