

MÖSSBAUER EFFECT STUDIES OF SOME IRON ALLOYS

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ABSTRACT

Mössbauer Conversion Electron Spectroscopy is used, to analyse the phases present in alloys of copper, silver and gold with iron. The alloys were produced by ^{57}Fe implantation, at doses between 1×10^{15} ions cm^{-2} and 5×10^{16} ions cm^{-2} , into foils of copper, silver and gold. The changes produced by ageing of these implanted alloys have also been investigated. The observed effects of radiation damage (accompanying the ion implantation process) on the iron hyperfine parameters are discussed. The results of the copper-iron and gold-iron alloys are compared with earlier Mössbauer studies of these alloys (in the earlier studies the alloys were prepared by solution quenching). There are no earlier Mössbauer studies of silver-iron alloys. A discussion of the Ion Implantation process and the various accompanying processes has also been included. Results of the calculations of the distribution of the ^{57}Fe atoms in the target and retained doses are also presented.

In addition to the above study we have also investigated the radiation induced disorder in an equiatomic iron aluminium alloy. The subsequent reordering on thermal annealing of the alloy, has also been studied.

Results of a brief study of a quenched 1 at % iron in palladium alloy are also given.

TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS	.. i
ABS TRACT	.. ii
INTRODUCTION	.. 1
REFERENCES	.. 7
CHAPTER I: MÖSSBAUER SPECTROSCOPY AND ION IMPLANTATION	.. 8
1.1 Introduction	.. 8
1.2 Mössbauer Spectroscopy	.. 8
1.2.1 Isomer Shift	.. 10
1.2.2 Magnetic Hyperfine Splittings	.. 12
1.2.3 Electric Quadrupole Splittings	.. 14
1.2.4 Linewidth	.. 16
1.2.5 Different Modes of taking Mössbauer Spectra	.. 17
1.2.6 Reduction of Data	.. 19
1.3 Ion Implantation	.. 21
1.3.1 Ion Ranges and Distribution	.. 23
1.3.2 Sputtering and the Modified Implantation Profile	.. 25
1.3.3 Radiation Damage During Implantation	.. 27
1.3.4 Thermal and Enhanced Diffusion	.. 27
1.3.5 Precipitation Effects	.. 29

	Page
1.4 Radiation Damage ..	30
1.4.1 Electronic Energy Loss ..	31
1.4.2 Nuclear Energy Loss ..	34
1.4.3 Macroscopic Damage Profile ..	36
1.4.4 Microscopic Nature of Damage ..	38
REFERENCES ..	41
CHAPTER II: EXPERIMENTAL ..	43
2.1 Introduction ..	43
2.2 Cu:Fe, Ag:Fe and Au:Fe Alloys ..	43
2.2.1 Sample Preparation ..	43
2.2.2 Harwell Variable Geometry Magnetic Isotope Separator ..	45
2.2.3 Sample Treatment ..	46
2.3 FeAl ..	47
2.3.1 Sample Preparation and Treatment ..	47
2.4 Quenching ..	48
2.5 Mössbauer Spectrometer ..	49
2.5.1 The Detection System ..	50
2.5.2 Doppler Shift Mechanism ..	51
2.5.3 Source ..	53
2.5.4 Calibration of Spectra ..	53
2.5.5 Reduction of Data ..	54
2.5.6 Low Temperature Mössbauer Spectroscopy ..	54
REFERENCES ..	56

	Page
CHAPTER III: THE DILUTE ALLOYS OF Cu:Fe, Ag:Fe AND Au:Fe	57
3.1 Introduction	57
3.2 Earlier Studies of Dilute Alloys of Cu:Fe, Ag:Fe and Au:Fe	57
3.2.1 Cu:Fe	57
3.2.2 Ag:Fe	60
3.2.3 Au:Fe	61
3.3 Results and Discussion of the Implanted Alloys	62
3.3.1 Cu:Fe	
(a) The Study of the Implanted Cu:Fe Alloys as a Function of the Implanted Dose	62
(b) Effect of Ageing on the Alloys at Different Temperatures	75
3.3.2 Ag:Fe	
(a) The Study of the Implanted Ag:Fe Alloys as a Function of the Implanted Dose	80
(b) Effect of Ageing on the Alloys of Different Temperatures	86
3.3.3 Au:Fe	
(a) The Effect of the Implanted Dose on the Mössbauer Spectra	90
(b) Variation with Anne- aling Temperature	94
3.4 Conclusions	95
3.5 Suggestions for Future Work	98
REFERENCES	100

	Page
CHAPTER IV: RADIATION INDUCED DISORDER IN EQUIATOMIC FeAl ALLOYS ..	102
4.1 Introduction ..	102
4.1.1 Processes used to disorder Alloys ..	102
4.1.2 Structure of the Alloy and a Brief Resume of Earlier Mössbauer Studies ..	103
4.2 Results ..	105
4.2.1 Experimental Results ..	105
4.2.2 The Model ..	106
4.3 Discussion ..	109
4.4 Conclusions ..	112
REFERENCES ..	113
CHAPTER V: EFFECT OF THE QUENCHING ON THE MÖSSBAUER SPECTRUM OF DILUTE ALLOYS OF IRON IN PALLADIUM ..	114
5.1 Introduction ..	114
5.1.1 Theory ..	114
5.1.2 Mössbauer Studies of Quenched Systems ..	116
5.2 Quenching Apparatus ..	118
5.3 Results and Discussion ..	119
5.4 Conclusions ..	121
REFERENCES ..	122
CURRICULUM VITAE ..	123