CONTENTS

LIST OF TABLES

LIST OF ILLUSTRATIONS

ABBREVIATIONS AND SYMBOLS

AAS	atomic absorption spectrometry
AFS	atomic fluorescence spectrometry
DGNAA	delayed gamma-ray neutron activation analysis
EDXRF	energy dispersive X-ray fluorescence
ENAA	epithermal neutron activation analysis
E-T	emission transmission GFAAS
FWHM	fullwidth at half maximum
FNAA	fast gamma-ray neutron activation analysis
HG	hydride-generation
HGAAS	hydride-generation atomic absorption spectrometry
HPGe	hyperpure (or intrinsic) germanium detector
HPLC	high performance liquid chromatography
ICP-MS	inductively coupled plasma-mass spectrometry
ICP-AES	inductively coupled plasma- atomic emission spectrometry
INAA	instrumental neutron activation analysis
LOD	limit of detection
MCA	multi-channel analyzer
NIST	the Nation Institute of Standard and Technology
NAA	neutron activation analysis
PGNAA	prompt gamma-ray neutron activation analysis
SRM	standard reference material
TNAA	thermal neutron activation analysis
RSD	relative standard deviation
XRF	X-ray fluorescence
A	atomic weight
A_o	activity at the end of the irradiation time
A_s	the saturation activity
A_{sam}	activity of sample
A_{bare}	activity in bare tube

A_{epi}	activity under 1 mm of cadmium
A_{std}	activity of standard
C_{sam}	concentration of element in sample
C_{std}	concentration of element in standard
Ci	Curi
N	number of nuclei
N_A	Avogadro's number
(n,γ)	(neutron, gamma) reaction
(n,p)	(neutron, proton) reaction
(n,α)	(neutron, alpha) reaction
nd	not detected
ppm	part per million
ppb	part per brillion
P	branching ratio
sam	sample
std	standard
t_c	counting time
t_d	decay time
t_m	measuring time
T,t	irradiation time
W_{sam}	weight of sample
W_{std}	weight of standard
W	mass of element
ε	molar absorptivity
ϕ	neutron flux
ϕ_{th}	thermal neutron flux
ϕ_{epi}	epithermal neutron flux
θ	isotropic abundance
σ	cross section
σ_{th}	thermal cross section
σ_γ	capture cross section

λ	decay constant
I_γ	capture resonance integral

For appendix B

χ	total mass absorption coefficient
μ_i	individual mass absorption coefficients
w_i	weight fraction of interest element *i*,
n	number of components.
ϕ_1	angle between excitation radiation from source and sample.
ϕ_2	angle between characteristic X-ray of element *i* in sample and detector
E_o	incident radiation energy.
E_1	energy of characteristic X-ray of element *i*.
I_I	characteristic X-ray of element *i* from sample
I_i^t	characteristic X -ray of element *i* from target.
I_i^{s+}	characteristic X -ray of element *i* from sample and target
χ_i	mass absorption coefficient of X -ray measurement of element *i*
$\rho_m D$	thickness of sample
F_i	absorption correction factor
S_i	sensitivity of element *i*