## List of Figures

No.	Caption of the Figure	Page No.
1.1	Schematic diagram of ADSs	6
1.2	Production of fissile isotopes from the fertile isotopes in ADSs	7
2.1	Experimental arrangement showing the irradiation set up using the Li(p,n)	19
	reaction neutron source at FOTIA	
2.2	Experimental arrangement showing the neutron production using the	22
	<sup>7</sup> Li(p,n) reaction using Pelletron facility at TIFR	
2.3	Rolling mill at target laboratory, BARC-TIFR Pelletron facility, Mumbai	25
2.4	Pelletizer, used for making lithium pellets	27
2.5	Typical set up used for γ-ray spectroscopy	28
2.6	ORTEC GMX (Model number: GMX 20-70-5) HPGe detector	31
2.7	Typical characteristic of detector efficiency	32
2.8	Schematic diagram of Neutron activation technique	34
4.1	Gamma-ray spectrum of activated <sup>nat</sup> In foil	59
4.2	Gamma-ray spectrum of activated <sup>197</sup> Au foil	60
4.3	Neutron spectra from the $^{7}$ Li(p,n) reaction with proton energies of 4, 5 and 6	64
	MeV	
4.4	Plot of the present experimental and theoretical $^{197}Au(n,\gamma)^{198g}Au$ reaction	69
	cross-section values as well as the experimental data available in the	
	literature, as a function of the neutron energy	
5.1	Comparison of experimental ${}^{55}Mn(n,\gamma){}^{55}Mn$ reaction cross-section from the	84
	present work and literature data with the theoretical values from TALYS 1.6	
	and EMPIRE-3.2.2	
6.1	$\gamma$ -ray spectrum from the irradiated sample of <sup>232</sup> Th at 18.8 MeV	94
6.2	$\gamma$ -ray spectrum from the irradiated sample of $^{238}$ U at 18.8 MeV	95
6.3	Comparison of present measured $^{232}$ Th(n, $\gamma$ ) reaction cross-section with the	109
	measured data available in the literature, computed values from TALYS-1.9	
	and evaluated data of ENDF/B-VII.1 and JENDL-4.0	
6.4	Comparison of present measured $^{238}$ U(n, $\gamma$ ) reaction cross-section with the	110
	measured data available in the literature, computed values from TALYS-1.9	
	and evaluated data of ENDF/B-VII.1 and JENDL-4.0	