

LIST OF FIGURES

	PAGE NO.
Fig. 1.1. Geological map of Rajasthan.	2
Fig. 1.2. Geological map of Malani igneous province, Rajasthan.	4
Fig. 1.3. Alk - SiO ₂ diagram of various rocks from the Malani igneous province.	7
Fig. 1.4. FeO - Al ₂ O ₃ +CaO diagram of rhyolitic rocks from Malani igneous province.	8
Fig. 1.5. Pre-Quaternary interpretative geological map of southwest Rajasthan.	10
Fig. 2.1. Geological map of felsic volcanics from Gurapratap Singh and Dir, Pali district, Rajasthan.	13
Fig. 2.2. Harker diagrams of Gurapratap Singh and Dir volcanics.	14
Fig. 2.3. Plot of normative Q-Or-Ab-H ₂ O of Gurapratap Singh and Dir volcanics.	16
Fig. 2.4. Variation of Rb, Sr and Ba with progressive differentiation in the felsic volcanics of Gurapratap Singh and Dir.	17
Fig. 2.5. Variation of Zn, Cr, Li, Ni and Co with progressive differentiation in the felsic volcanics of Gurapratap Singh and Dir.	18
Fig. 2.6. Variation in Ni/Co, Fe/Zn and Mg/Li with progressive differentiation in the felsic volcanics of Gurapratap Singh and Dir.	19
Fig. 2.7. Geological map of Siwana ring structure, Barmer district, Rajasthan.	21
Fig. 2.8. Geological map of Tavidar volcanics, Jalore district, Rajasthan.	24
Fig. 2.9. The Deccan volcanic province showing the distribution of plugs and alkaline intrusions.	28

Fig. 2.10.	Geological map of Mundwara alkali igneous complex, Rajasthan.	29
Fig. 3.1.	Decay scheme diagram for the branched decay of $^{40}\text{K}_{19}$ to $^{40}\text{Ar}_{18}$ by electron capture and by positron emission and to $^{40}\text{Ca}_{20}$ by emission of negative betaparticles.	33
Fig. 3.2.	Schematic of the complete mass spectrometer, gas extraction - purification system.	44
Fig. 3.3.	Section through gas extraction furnace and purifi- cation line.	45
Fig. 3.4.	Middle section of the S-S block with only one valve assembly shown.	46
Fig. 3.5.	Typical argon spectrum.	49
Fig. 4.1.	^{40}Ar - ^{39}Ar age spectrum for Diri Basalt (D/88).	64
Fig. 4.2.	^{40}Ar - ^{39}Ar age spectrum for Diri Dacite (D/25).	66
Fig. 4.3.	^{40}Ar - ^{39}Ar age spectrum for Diri Rhyolite (D/174).	68
Fig. 4.4.	Rb-Sr conventional isochron diagram for Basalt-Andesite- Dacite-Rhyolite association from Diri and Gurapratap Singh.	72
Fig. 4.5.	Rb-Sr best isochron diagram for Basalt-Andesite- Dacite-Rhyolite association from Diri and Gurapratap Singh.	74
Fig. 4.6.	Rb-Sr conventional isochron diagram for Ultrapotassic Rhyolites from Diri and Gurapratap Singh.	77
Fig. 4.7.	^{40}Ar - ^{39}Ar age spectrum for Jalore Granite (JR 86/15).	81
Fig. 4.8.	^{40}Ar - ^{39}Ar age spectrum for Jalore Granite (JR 86/17).	83
Fig. 4.9.	Rb-Sr conventional isochron diagram for Jalore Granite.	86
Fig. 4.10.	Rb-Sr conventional isochron diagram for Siwana Granite.	89
Fig. 4.11.	Rb-Sr conventional pooled isochron diagram for Peralkaline Granites and Peralkaline Volcanics from Siwana.	91
Fig. 4.12.	Rb-Sr conventional isochron diagram for Outer Rhyolites from south of Siwana.	93

Fig. 4.13.	Rb-Sr conventional pooled isochron diagram for Outer and Ultrapotassic Rhyolites.	94
Fig. 4.14.	^{40}Ar - ^{39}Ar age spectrum for Tavidar Andesite (VA/181).	100
Fig. 4.15.	^{40}Ar - ^{39}Ar age spectrum for Tavidar Andesite (K/67).	103
Fig. 4.16.	$^{40}\text{Ar}/^{36}\text{Ar}$ vs. $^{39}\text{Ar}/^{36}\text{Ar}$ isochron plot for Tavidar Andesite (VA/181).	104
Fig. 4.17.	$^{40}\text{Ar}/^{36}\text{Ar}$ vs. $^{39}\text{Ar}/^{36}\text{Ar}$ isochron plot for Tavidar Andesite (K/67).	105
Fig. 4.18.	^{40}Ar - ^{39}Ar age spectrum for Tavidar Trachyte (VA/58).	107
Fig. 4.19.	^{40}Ar - ^{39}Ar age spectrum for Tavidar Trachyte (K/30).	109
Fig. 4.20.	$^{40}\text{Ar}/^{36}\text{Ar}$ vs. $^{39}\text{Ar}/^{36}\text{Ar}$ isochron plot for Tavidar Trachyte (VA/58).	110
Fig. 4.21.	$^{40}\text{Ar}/^{36}\text{Ar}$ vs. $^{39}\text{Ar}/^{36}\text{Ar}$ isochron plot for Tavidar Trachyte (K/30).	111
Fig. 4.22.	^{40}Ar - ^{39}Ar age spectrum for Tavidar Rhyolite (VA/183).	115
Fig. 4.23.	$^{40}\text{Ar}/^{36}\text{Ar}$ vs. $^{39}\text{Ar}/^{36}\text{Ar}$ isochron plot for Tavidar Rhyolite (VA/183).	116
Fig. 4.24.	^{40}Ar - ^{39}Ar age spectrum for Tavidar Potassic Rhyolite (VA/168).	119
Fig. 4.25.	$^{40}\text{Ar}/^{36}\text{Ar}$ vs. $^{39}\text{Ar}/^{36}\text{Ar}$ isochron plot for Tavidar Potassic Rhyolite (VA/168).	120
Fig. 4.26.	^{40}Ar - ^{39}Ar age spectrum for Tavidar Hawaiiite (VA/119).	122
Fig. 4.27.	^{40}Ar - ^{39}Ar age spectrum for Tavidar Hawaiiite (K/69A).	124
Fig. 4.28.	$^{40}\text{Ar}/^{36}\text{Ar}$ vs. $^{39}\text{Ar}/^{36}\text{Ar}$ isochron plot for Tavidar Hawaiiite (VA/119).	125
Fig. 4.29.	$^{40}\text{Ar}/^{36}\text{Ar}$ vs. $^{39}\text{Ar}/^{36}\text{Ar}$ isochron plot for Tavidar Hawaiiite (K/69A).	126
Fig. 4.30.	Plot of initial Sr ratios Against Sr content of Tavidar volcanics.	130

Fig. 4.31.	Plot of mean initial Sr ratio of Tavidar volcanics and Mundwara igneous complex on Sr evolution diagram.	131
Fig. 4.32.	^{40}Ar - ^{39}Ar age spectrum for Musala Essexite (MR 86/1).	134
Fig. 4.33.	$^{40}\text{Ar}/^{36}\text{Ar}$ vs. $^{39}\text{Ar}/^{36}\text{Ar}$ isochron plot for Musala Essexite (MR 86/1).	135
Fig. 4.34.	^{40}Ar - ^{39}Ar age spectrum for Musala Basalt (MR 86/2).	138
Fig. 4.35.	$^{40}\text{Ar}/^{36}\text{Ar}$ vs. $^{39}\text{Ar}/^{36}\text{Ar}$ isochron plot for Musala Basalt (MR 86/2).	139
Fig. 4.36.	^{40}Ar - ^{39}Ar age spectrum for Musala Syenite (MR 86/4).	141
Fig. 4.37.	$^{40}\text{Ar}/^{36}\text{Ar}$ vs. $^{39}\text{Ar}/^{36}\text{Ar}$ isochron plot for Musala Syenite (MR 86/4).	142
Fig. 4.38.	^{40}Ar - ^{39}Ar age spectrum for Musala Syenite (MR 86/5).	145
Fig. 4.39.	^{40}Ar - ^{39}Ar age spectrum for Mer Syenite (MR 86/7).	147
Fig. 4.40.	$^{40}\text{Ar}/^{36}\text{Ar}$ vs. $^{39}\text{Ar}/^{36}\text{Ar}$ isochron plot for Mer Syenite (MR 86/7).	148
Fig. 4.41.	^{40}Ar - ^{39}Ar age spectrum for Toa Gabbro (MR 86/9).	150
Fig. 4.42.	Plot of initial Sr ratios Against Sr content of Mundwara alkali igneous complex.	154