

LIST OF PLATES

Plate No.		After page No.
1 1	Emerald from Columbia (from Gems and Crystal, by Anna S. Sofianides and George Harlow)	1
1.2	Aquamarine enclosed by albite (from Gems and Crystal)	1
1.3	Heliodor (from Gems and Crystal)	1
1.4	Green beryl (from OMC)	1
1.5	Cut and polished beryls (from Gems and Crystal)	3
1.6a	Beryl from primary source at Bagdhapa	5
1.6b	Highly weathered pegmatite from Badmal	5
1.7a	Author collecting sample from the scree at the illegal mining site at Badmal	5
1.7b	Beryl from colluvial zone at Meghpal	5
1 8	Beryl samples being collected along a small stream near Bagdhapa	5
3 1a	Prismatic beryl crystals from Karur and Siberia	27
3.1b	Beryls crystals from Orissa revealing well developed prismatic habit	27
3.2a	Petrogenetic solid inclusion of plagioclase and quartz in beryl from Orissa	30
3.2b	Petrogenetic solid inclusion of sillimanite in Orissan beryl	30
3.3	Tubular inclusions in Orissan beryl	30
3.4	Polyphase inclusions in Orissan beryl	30
3.5a	Secondary inclusions along a fracture plane in beryl from Orissa	30
3.5b	Pseudosecondary inclusions in beryl from Orissa	30
4 1	Striation on prism face of beryl crystal oriented parallel to c-axis of the crystal	40
4 2	Rectangular growth hillocks in between striations	40
4 3	Elliptical growth pyramids with distinct growth layers parallel to the c-axis	40
4.4	Two half of elliptical growth features oriented parallel to the c-axis of the crystal	40
4.5a	Hexagonal growth features with distinct growth layers (inner layer elliptical, outer layers are hexagonal)	40
4 5b	Hexagonal growth features parallel to the c-axis of the crystal. Inner starting layers are elliptical, while outer hexagonal	40
4.6	Hexagonal growth hillock with single layer	40
4 7	Numerous hexagonal growth features coalescing into one another	40

4.8	Interaction of numerous hexagonal growth hillocks resulting in intergrowth of layers	40
4.9	Unequally spaced hexagonal growth features	40
4.10	Densely populated partially developed growth hillocks	40
4.11	Fully developed growth hillocks	40
4.12	Natural etch pit on a prism face of beryl crystal parallel to c-axis	40
4.13	Rhombus shaped etch pit along the m-m edge	40
4.14	Crowded rhombus shaped pits parallel to the c-axis	40
4.15	Isolated etch pits with distinct etch front	40
4.16	Numerous isolated etch pits parallel to the c-axis of the crystal	40
4.17	Couple of oriented etch pit flanked on either side by growth curves	40
4.18a	Etch pit with growth nuclei at the centre of etch pit (observed as dark spot)	40
4.18b	Etch pit with the presence of two growth nuclei at the centre of etch pit (observed as two dark spot)	40
4.19	Densely populated etch pits on a prism faces oriented parallel to c-axis	40
4.20	Rectangular etch pits with longer axis parallel to c-axis of the crystal	40
4.21	SEM photograph depicting presence of screw dislocation growth on prism face of beryl crystal	40
5.1a	Fourier Transform Infrared Spectroscopy at RSIC, IIT, Mumbai	43
5.1b	Raman Spectroscopy at RSIC, IIT, Mumbai	43
6.1a	Photograph depicting colourless beryl which on irradiation turned to greenish yellow	75
6.1b	Photograph depicting irradiated colourless beryl which on heating to 300 °C turned to yellow-orange	75
6.2a	Irradiated colourless beryl on heating to 400 °C under controlled conditions turned pale blue (above beryl crystal shown in Plate 6.1 were not heated to 400 °C as it had developed numerous cracks perpendicular to c-axis)	75
6.2b	Natural blue beryls from Orissa	75
6.3	Irradiated colourless beryl (reveal change of colour from colourless to green to yellowish green and yellow-orange, dark coloured crystals are quartz sample)	76
6.4	ESR spectrometer at RSIC, IIT, Mumbai	80