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## **APPENDICES**

**APPENDIX A**  
**X-ray Mapping**

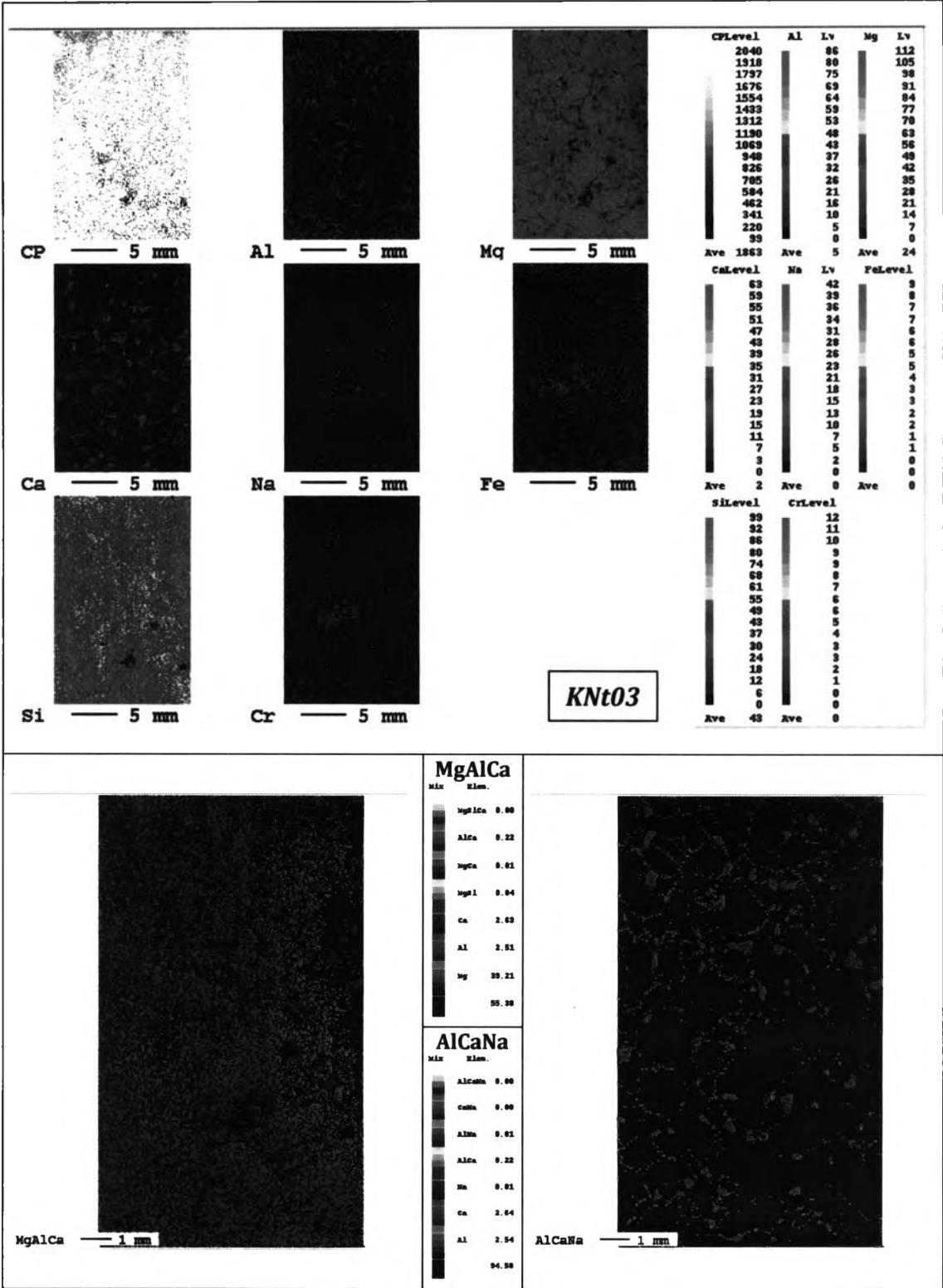


Figure A.1 Qualitative elemental analyses by X-ray mapping of corundum-barren orthopyroxenite "Knt03" and output images resulted from 3-different-element combination



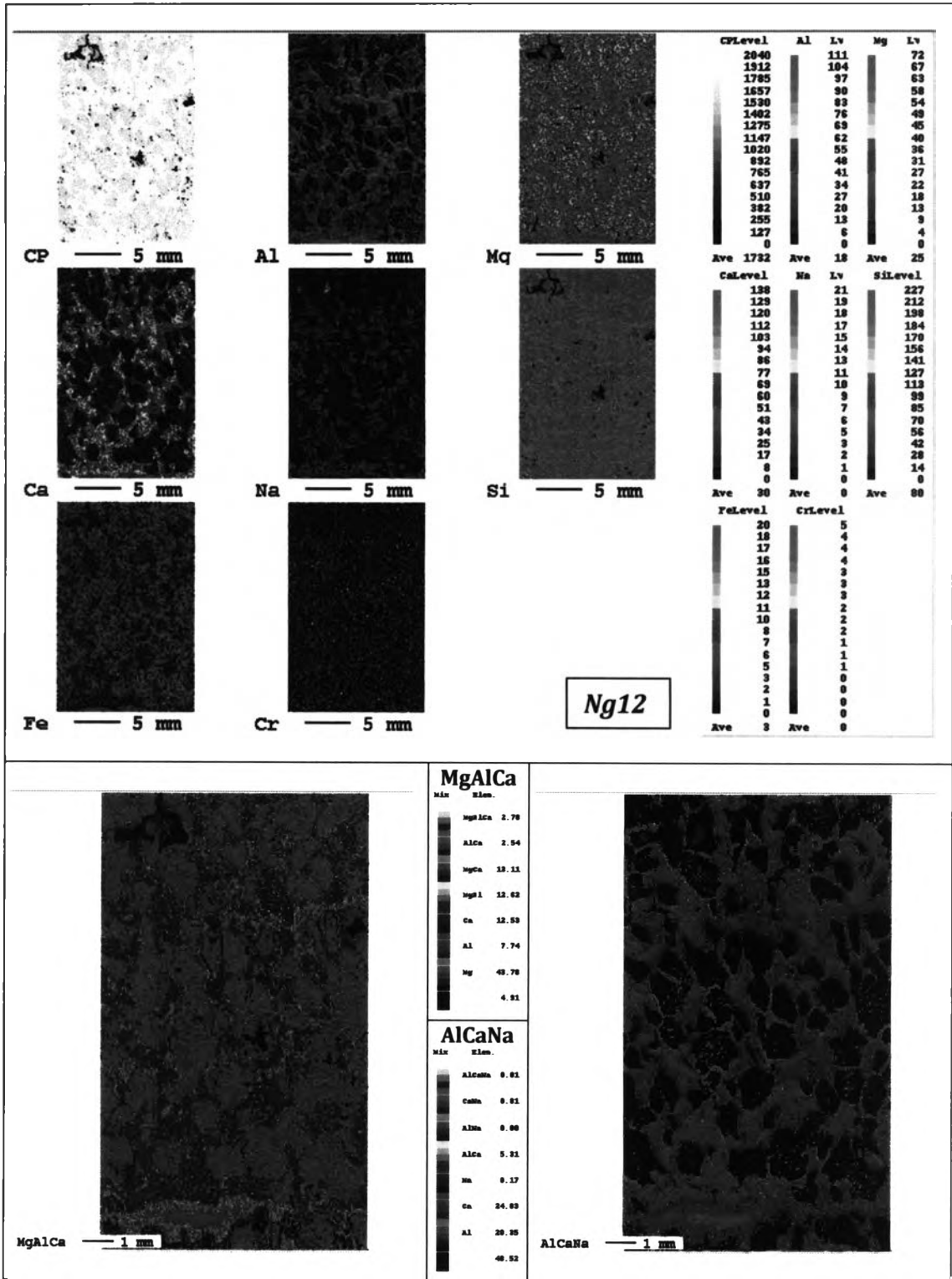


Figure A.2 Qualitative elemental analyses by X-ray mapping of corundum-barren websterite "Ng12" and output images resulted from 3-different-element combination.

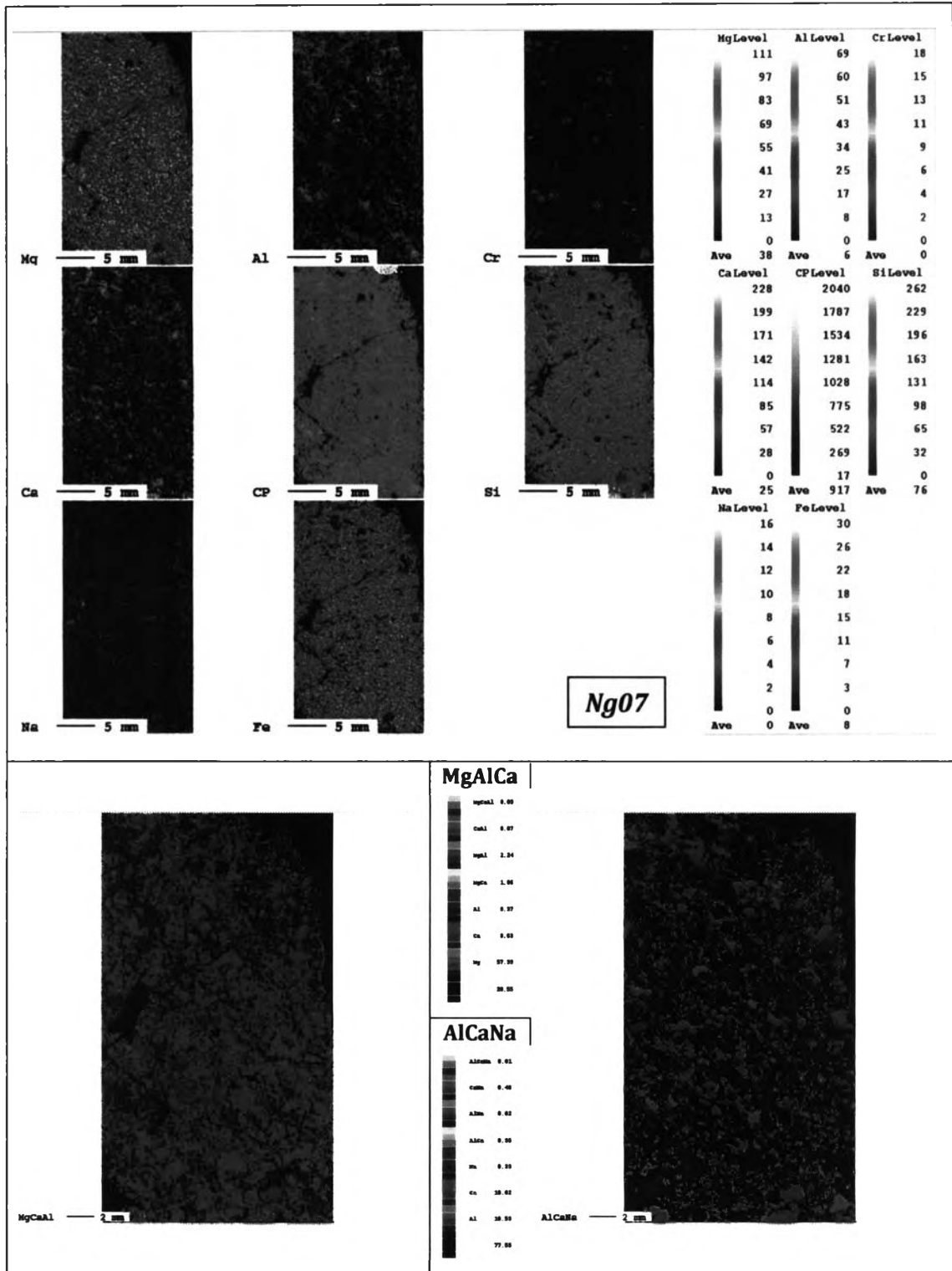


Figure A.3 Qualitative elemental analyses by X-ray mapping of corundum-barren spinel lherzolite "Ng07" and output images resulted from 3-different-element combination.

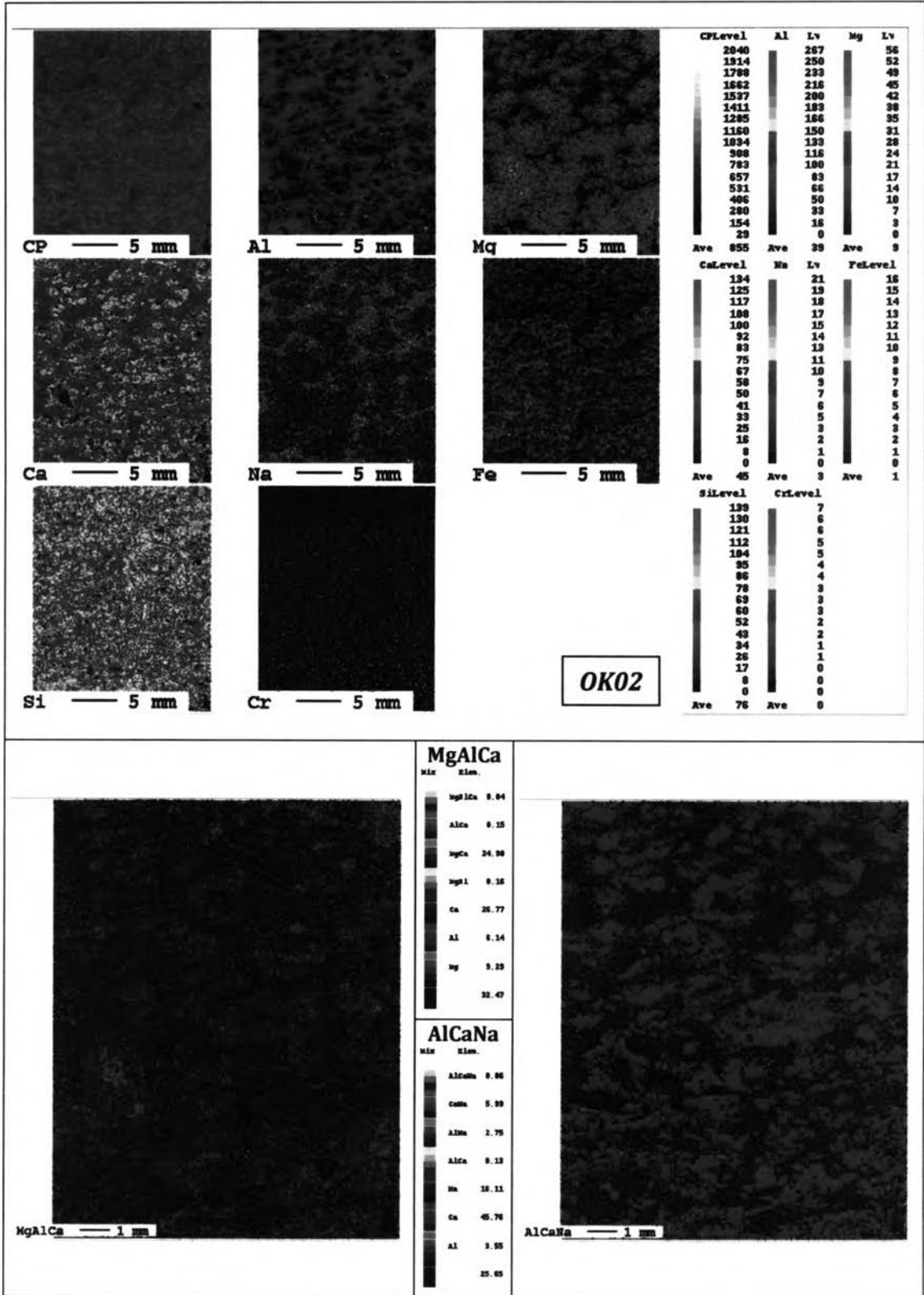


Figure A.4 Qualitative elemental analyses by X-ray mapping of foliated corundum-bearing mafic granulite "OK02" and output images resulted from 3-different-element combination

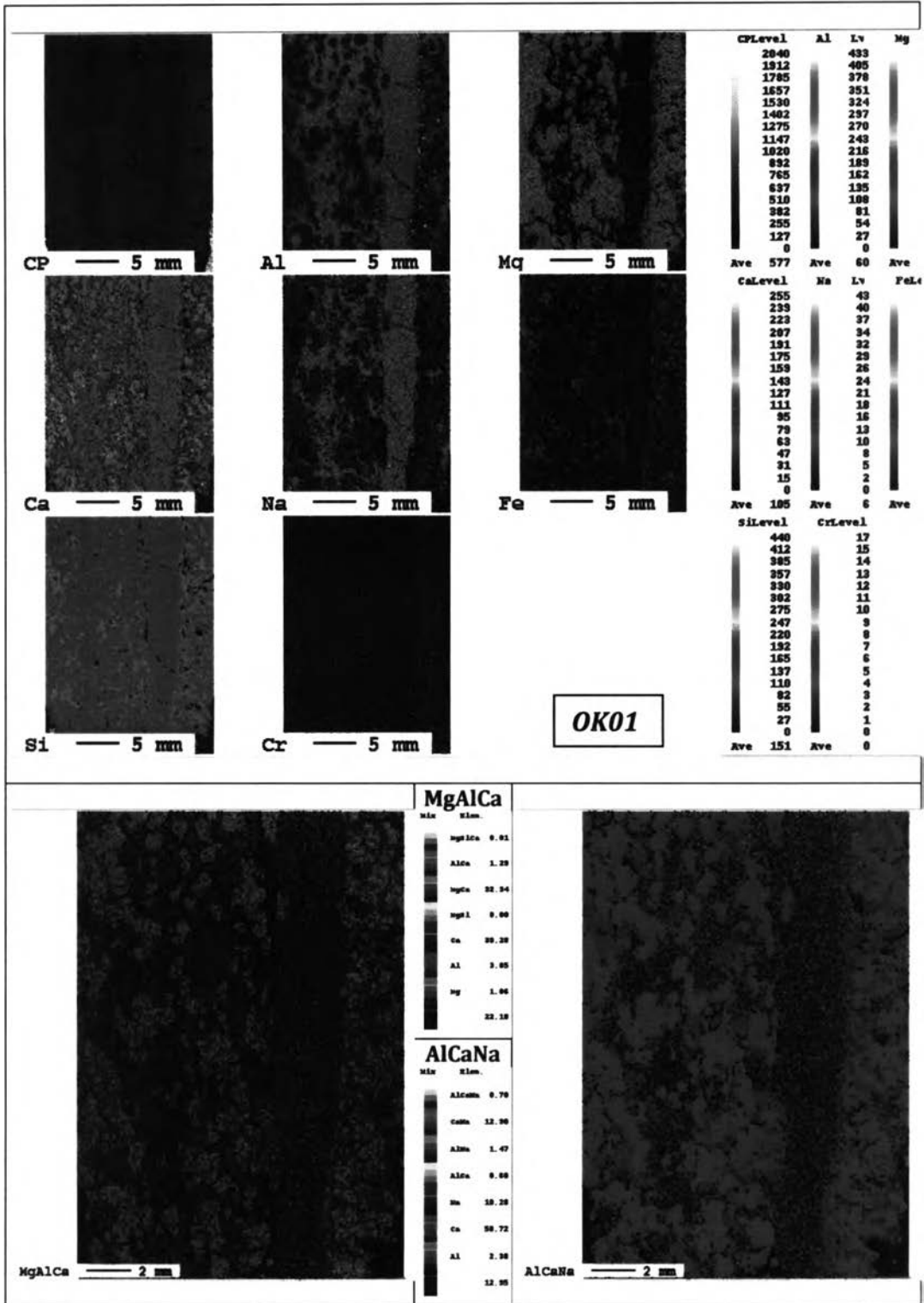


Figure A.3 Qualitative elemental analyses by X-ray mapping of banded corundum-bearing mafic granulite "OK01" and output images resulted from 3-different-element combination.

**APPENDIX B**  
**Criteria For Accepting/Rejecting EPMA Analyses**

**Appendix B Criteria for accepting/rejecting EPMA analyses.****Olivine**

		Minimum	Ideal	Maximum
Oxides	Total Oxide	99.00	100.00	101.00
Stoichiometry per 4(O)	Total Cation	2.97	3.00	3.03
	Si	0.99	1.00	1.01
	Fe+Mg+Mn+Ni	1.98	2.00	2.02
	Ca, CrAl,Ti		Very low	

**Pyroxene(after any Fe<sup>3+</sup> calculation)**

		Minimum	Ideal	Maximum
Oxides	Total Oxide	99.00	100.00	101.00
Stoichiometry per 6(O)	Total Cation	3.96	4.00	>_4.04
	Si	-	<2.00	2.02
	Fe <sup>2+</sup> +Mg+Mg+Ni+Ca		<2.00	2.02
	Cr,Al,Ti		Some allowed	
	Na		Some allowed	
	K		Very low	

**Garnet(after Fe<sup>3+</sup> calculation)**

		Minimum	Ideal	Maximum
Oxides	Total Oxide	99.00	100.00	101.00
Stoichiometry per 24(O)	Total Cation	15.84	16.00	16.00
	Si	5.94	6.00	6.06
	Fe <sup>2+</sup> +Mg+Mn+Ca+Ni	5.94	6.00	6.06
	Al+Fe <sup>3+</sup> + Cr	3.96	4.00	4.04
	Na,K		Very low	

**Spinel Griup(after Fe<sup>3+</sup> calculation)**

		Minimum	Ideal	Maximum
Oxides	Total Oxide	99.00	100.00	101.50
Stoichiometry per 32(O)	Total Cation	23.76	24.00	24.24
	Mg+Fe <sup>2+</sup> +Mn+Ni-Ti	7.92	8.00	8.08
	Al+Cr+Fe <sup>3+</sup> +2Ti	15.84	16.00	16.16
	Ca,Na,K,Si		Very low	

**Feldspar**

		Minimum	Ideal	Maximum
Oxides	Total Oxide	99.00	100.00	101.00
Stoichiometry per 8(O)	Total Cation	4.95	5.00	5.05
	Na+K+Ca+Ba	0.99	1.00	1.01
	Si+Al	3.96	4.00	4.04
	Al-(Ca+Ba)	0.99	1.00	1.01
	Si-(k+Na)	1.98	2.00	2.02

**Rutile**

		Minimum	Ideal	Maximum
Oxides	Total Oxide	99.00	100.00	101.00
Stoichiometry per 2(O)	Total Oxide	99.00	100.00	101.00
	Total Cation	0.99	1.00	1.01
	Ti	0.99	1.00	1.01

**Ilmenite(after Fe<sup>3+</sup> calculation)**

		Minimum	Ideal	Maximum
Oxides	Total Oxide	99.00	100.00	101.00
Stoichiometry per 6(O)	Total Cation	3.96	4.00	4.04
	Ti+Fe <sup>3+</sup> +Cr+Al	1.98	2.00	2.02
	Fe <sup>2+</sup> +Mg+Mn	1.98	2.00	2.02

## BIOGRAPHY

Mr. Tawatchai Chualaowanich was born in Amphoe Bandon, Surathani Province in 1969, where his mother hometown is located. During 1977 to 1981, he studied in a local elementary school, named Chareonwit, in Amphoe Chawang, Nakorn Sri Thamarat province. In 1981, he moved to stay with grandmother in Amphoe Muang, Rayong Province. He continued studying there until completing his primary school education from Rayongwittayakhom School. In 1985, he pursued his study in Bangkok by entering Patumkongka School (1985-1988) and later Chulalongkorn University (1988-1992). He graduated with the bachelor degree of Science (B.Sc.) in Geology from the Faculty of Science in 1992. During 1994-1998, he was granted by the Royal Thai Government, under the Ministry of Science and Technology Scholarship, to study aboard. In 1997 and 1998, he respectively earned his Master degree of Science (M.Sc.) in Geology and in Mineral Economics from Colorado School of Mines, U.S.A. In 2006, while working at the Department of Mineral resources, he enrolled into the Ph.D. program of the Department of Geology, Chulalongkorn University. His Ph.D.'s thesis involves petrogenesis of ruby-bearing xenoliths from Simba and Emali basaltic terranes in southeastern region of Kenya.

