

GY343 Petrology

Average major element oxide composition (weight %) of common igneous rock types:

Name	Nepheline Syenite	Phonolite	Syenite	Trachyte	Rhyolite	Adamelite
SiO ₂	54.99	56.19	58.58	61.21	72.82	68.65
TiO ₂	0.60	0.62	0.84	0.70	0.28	0.54
Al ₂ O ₃	20.96	19.04	16.64	16.96	13.27	14.55
Fe ₂ O ₃	2.25	2.79	3.04	2.99	1.48	1.23
FeO	2.05	2.03	3.13	2.29	1.11	2.70
MnO	0.15	0.17	0.13	0.15	0.06	0.08
MgO	0.77	1.07	1.87	0.93	0.39	1.14
CaO	2.31	2.72	3.53	2.34	1.14	2.68
Na ₂ O	8.23	7.79	5.24	5.47	3.55	3.47
K ₂ O	5.58	5.24	4.95	4.98	4.30	4.00
P ₂ O ₅	0.13	0.18	0.29	0.21	0.07	0.19
Total	98.02	97.84	98.24	98.23	98.47	99.23

Name	Grano- diorite	Rhyodacite	Dacite	Tonalite	Diorite	Andesite
SiO ₂	66.09	65.55	65.01	61.52	57.48	57.94
TiO ₂	0.54	0.60	0.58	0.73	0.95	0.87
Al ₂ O ₃	15.73	15.04	15.91	16.48	16.67	17.02
Fe ₂ O ₃	1.38	2.13	2.43	1.83	2.50	3.27
FeO	2.73	2.03	2.30	3.82	4.92	4.04
MnO	0.08	0.09	0.09	0.08	0.12	0.14
MgO	1.74	2.09	1.78	2.80	3.71	3.33
CaO	3.83	3.62	4.32	5.42	6.58	6.79
Na ₂ O	3.75	3.67	3.79	3.63	3.54	3.48
K ₂ O	2.73	3.00	2.17	2.07	1.76	1.62
P ₂ O ₅	0.18	0.25	0.15	0.25	0.29	0.21
Total	98.78	98.07	98.53	98.63	98.52	98.71

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Name	Monzonite	Latite	Trachy-andesite	Mugearite	Trachy-basalt	Hawaiite
SiO ₂	62.60	61.25	58.15	50.52	49.21	47.48
TiO ₂	0.78	0.81	1.08	2.09	2.40	3.23
Al ₂ O ₃	15.65	16.01	16.70	16.71	16.63	15.74
Fe ₂ O ₃	1.92	3.28	3.26	4.88	3.69	4.94
FeO	3.08	2.07	3.21	5.86	6.18	7.36
MnO	0.10	0.09	0.16	0.26	0.16	0.19
MgO	2.02	2.22	2.57	3.20	5.17	5.58
CaO	4.17	4.34	4.96	6.14	7.90	7.91
Na ₂ O	3.73	3.71	4.35	4.73	3.96	3.97
K ₂ O	4.06	3.87	3.21	2.46	2.55	1.53
P ₂ O ₅	0.25	0.33	0.41	0.75	0.59	0.74
Total	98.36	97.98	98.06	97.60	98.44	98.67

Name	Gabbro	Norite	Dolerite	Basalt	Nephelinite	Tephrite
SiO ₂	50.14	50.44	50.18	49.20	40.60	47.80
TiO ₂	1.12	1.00	1.14	1.84	2.66	1.76
Al ₂ O ₃	15.48	16.28	15.26	15.74	14.33	17.00
Fe ₂ O ₃	3.01	2.21	2.86	3.79	5.48	4.12
FeO	7.62	7.39	8.05	7.13	6.17	5.22
MnO	0.12	0.14	0.19	0.20	0.26	0.15
MgO	7.59	8.73	6.78	6.73	6.39	4.70
CaO	9.58	9.41	9.24	9.47	11.89	9.18
Na ₂ O	2.39	2.26	2.56	2.91	4.79	3.69
K ₂ O	0.93	0.70	1.04	1.10	3.46	4.49
P ₂ O ₅	0.24	0.15	0.27	0.35	1.07	0.63
Total	98.22	98.71	97.57	98.46	97.10	98.74

Name	Anorthosite	Pyroxenite	Peridotite			

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SiO ₂	50.28	46.27	42.26			
TiO ₂	0.64	1.47	0.63			
Al ₂ O ₃	25.86	7.16	4.23			
Fe ₂ O ₃	0.96	4.27	3.61			
FeO	2.07	7.18	6.58			
MnO	0.05	0.16	0.41			
MgO	2.12	16.04	31.24			
CaO	12.48	14.08	5.05			
Na ₂ O	3.15	0.92	0.49			
K ₂ O	0.65	0.64	0.34			
P ₂ O ₅	0.09	0.38	0.10			
Total	98.35	98.57	94.94			