U.S. DEPARTMENT OF THE INTERIOR

U.S. GEOLOGICAL SURVEY

GEOCHEMICAL DATA FOR JURASSIC DIABASE ASSOCIATED WITH EARLY MESOZOIC BASINS IN THE EASTERN UNITED STATES: FARMVILLE AND SCOTTSVILLE BASINS AND VICINITY, VIRGINIA

By

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FARMVILLE AND SCOTTSVILLE BASINS AND VICINITY, VIRGINIA

Seven (7) samples of diabase from five (5) dikes were collected by two (2) workers in Virginia and analyzed by the U.S. Geological Survey. Laura Cummins of Florida State University contributed four (4) samples from four (4) dikes in the Piedmont for which selected major- and trace-element chemistry is here provided; the balance of the chemistry (major- and selected trace-element data) is documented in Cummins (1987). Froelich and Gottfried collected three (3) samples across a single dike in the Farmville basin for which complete chemistry is documented here.

The platinum (Pt) and palladium (Pd) abundances are very low, consistent with those of the high Fe, quartz-normative (HFQ) magmas throughout the province.

References

Cummins, L.E., 1987, Geochemistry, mineralogy, and origin of Mesozoic diabase dikes of Virginia: unpublished Ph.D. thesis, Florida State University, Tallahassee, 454 p.

EXPLANATION FOR PLATE 1

Geochemical sample locality

C- ● L.E. Cummins, 1987

● Froelich and Gottfried, USGS, 1985

SAMPLE NO.	MAGMA TYPE	DESCRIPTION OF SAMPLES
		Diabase dikes - Table 1
FG VF-1	High Fe, quartz normative	Diabase
-2	"	"
-3	"	"
		Diabase dikes
		L. Cummins samples - Table 1
C-131A-1	High Fe, quartz normative	Diabase
C-154A-1	"	"
C-154D-1	"	"
C-154D-3	"	"

Table 1. Farmville and Scottsville basins and vicinity, Virginia. Diabase dikes.

	W-243895 FG-VF-1	W-243896 FG-VF-2	W-243897 FG-VF-3	W-250886 C-131A-1	W-250887 C-154A-1	W-250888 C-154D-1	W-250889 C-154D-3
Lat.	37°24'N	37°24'N	37°24'N	37°38'N	37°53'N	37°47'N	37°51'N
Long.	78°24'W	78°24'W	78°24'W	78°31'W	78°36'W	78°35'W	78°36'W
SiO_2 (%)	52.70	52.60	52.60	—	—	—	—
TiO_2	1.13	1.08	1.10	—	—	—	—
Al_2O_3	13.70	13.80	13.70	—	—	—	—
$Fe_2O_3^*$	—	—	—	14.59	14.44	14.59	14.30
Fe_2O_3	2.85	2.87	2.23	—	—	—	—
FeO	10.20	10.80	10.80	—	—	—	—
MnO	0.22	0.22	0.22	—	—	—	—
MgO	5.44	5.63	5.50	—	—	—	—
CaO	9.30	10.20	10.20	9.7	9.9	9.4	10.2
Na_2O	2.57	2.41	2.33	2.45	2.48	2.47	2.52
K_2O	0.78	0.53	0.56	—	—	—	—
P_2O_5	0.15	0.14	0.14	—	—	—	—
H_2O^+	0.90	0.72	0.63	—	—	—	—
H_2O^-	0.20	0.09	0.08	—	—	—	—
CO_2	<0.01	0.03	0.02	—	—	—	—
S	0.10	0.09	0.10	—	—	—	—
F	0.03	0.01	0.03	—	—	—	—
Cl	<0.00	<0.00	<0.00	—	—	—	—
Σ	100.28	101.23	100.24	—	—	—	—
B (ppm)	13.0	7.3	7.1	—	—	—	—
Sc	47	50	47	49	49	48	50
Cr	23.0	25.0	23.0	18.0	20.0	19.0	19.0
Co	49	50	47	49	52	50	52
Ni	35	28.0	33	17.0	18.0	18.0	18.0
Cu	67	60	68	58	50	63	46
Zn	98	75	83	120	120	130	110
Ga	23.0	22.0	22.0	—	—	—	—
As	<2.60	<2.30	<2.40	2.20	1.90	2.40	<1.00
Rb	29.0	24.0	19.0	27.0	29.0	32	30
Sr	226	153	152	250	160	240	180
Ag	0.0230	0.0250	0.0270	—	—	—	—
Sb	0.32	<0.30	<0.40	0.150	0.180	<0.210	0.210
Cs	0.58	0.74	0.61	1.60	1.20	1.10	1.00
Ba	240	137	157	220	150	220	150
Y	29.0	28.0	29.0	—	—	—	—
La	10.3	9.8	9.7	12.0	12.0	12.0	10.0
Ce	21.0	20.0	19.0	23.0	24.0	24.0	21.0
Nd	12.0	11.0	11.0	13.0	13.0	12.0	13.0
Sm	3.4	3.3	3.3	3.7	3.6	3.5	3.3
Eu	1.10	1.05	1.00	1.17	1.10	1.12	1.10
Tb	0.76	0.73	0.72	0.82	0.80	0.82	0.74
Yb	3.3	3.7	3.4	3.4	3.5	3.2	3.2
Lu	0.51	0.49	0.53	0.49	0.50	0.46	0.47
Zr	101	96	98	—	—	—	—
Hf	2.30	2.20	2.30	2.70	2.80	2.70	2.00
Nb	4.6	4.6	5.2	—	—	—	—
Ta	0.35	0.35	0.36	0.61	1.10	0.95	0.52
Th	2.50	2.20	2.30	3.0	2.90	2.80	2.10
U	0.69	0.60	0.57	0.86	0.91	0.73	0.52
Pd (ppb)	1.50	1.30	2.50	—	—	—	—
Pt	1.90	3.2	5.7	—	—	—	—
Au	<7.0	<9.0	220	<3.0	<2.50	<2.30	<1.90