Table 3. --Major oxides, minor elements, and partial norms of samples from cave deposits and soil, Isla de Mona, P. R.

[Chemical analyses for major oxides by U. S. Geological Survey laboratories: analysts P. Elmore, S. Botts, G. Chloe, L. Artis, H. Smith, and J. Glenn. N.R. = not reported. Semiquantitative spectrographic analyses for minor elements by U. S. Geological Survey laboratories: analysts J. L. Harris and W. B. Crandell. Elements looked for in all samples but not detected: Ag, As, Au, Bi, Cd, Eu, Ge, Hf, In, Li, Mo, Nb, Pd, Pt, Re, Sb, Sn, Ta, Te, Th, Tl, U, W, Zn; also looked for in sample M-32 but not detected were Pr, Nd, Sm. 0 = not detected. The first-stated sums for the major oxides are obtained by using the HCl-soluble S figures; sums in parentheses are obtained by using the Aqua regia-soluble S figure (also in parentheses).]

Field number	M-23B	G-3	G-4	I-11	I-12	M-32
Laboratory number	W167675	W167678	W167879	W167680	W167681	W167677
Location coordinates 1/	28,370 N.; 3,080 E.	28,370 N.; 2,880 E.	28,370 N.; 2,880 E.	28,390 N.; 2,790 E.	28,410 N.; 2,790 E.	29,230 N.; 330 E.
Location description	Cueva al Lado del Faro, north end at cliff	Cueva del Lirio	Cueva del Lirio	Cueva del Lirio	Cueva del Lirio	Cuevas del Centro
			Major oxides (percent)			
SiO_2	0.85	1.6	0.31	1.4	0.30	26.0
Al_2O_3	1.2	.32	.10	.40	.00	20.8
Fe_2O_3	.83	.07	.00	.14	.00	6.0
FeO	.08	.10	.00	.04	.04	2.5
MgO	1.8	.95	.38	1.9	.40	1.1
CaO	49.0	35.0	32.1	51.3	32.4	6.2
Na_2O	.65	2.0	.95	.40	.27	.25
K_2O	.15	.27	.12	.11	.02	1.2
H_2O-	1.4	14.9	9.8	.85	19.7	7.6
H_2O+	2.9	3.3	13.8	1.1	1.6	6.4
TiO_2	.07	.00	.00	.00	.00	1.1
P_2O_5	24.2	17.6	14.2	3.0	.17	.64
MnO	.00	.00	.04	.10	.10	.28
CO_2	15.8	.30	.15	38.7	.10	2.7
Volatiles other than H_2O and CO_2	N.R.	3.6	5.2	.00	.00	17.2
Aqua regia-soluble S as SO_3	N.R.	(19.6)	(29.8)	(.48)	(45.5)	(.12)
HCl-soluble S as SO_3	.52	18.0	26.4	.51	42.6	.10
Sum	99	98(100)	104(107)	100(100)	98(101)	100(100)
			Minor elements (percent)			
B	0.003	0.003	0	0	0	0.005
Ba	.003	.0007	.0005	.005	.002	.01
Be	0	0	0	0	0	.00015
Ce	0	0	0	0	0	.01
Co	0	0	0	0	0	.0015
Cr	.005	.0007	0	.001	0	.01
Cu	.03	.005	.001	.002	.0005	.007
Ga	0	0	0	0	0	.0015
La	0	0	0	0	0	.007
Ni	0	0	0	0	0	.007
Pb	0	0	0	.0005	0	.001
Sc	0	0	0	0	0	.001
Sr	.1	.03	.003	.07	.02	.005
V	.003	0	0	0	0	.005
Y	.002	0	0	0	0	.005
Yb	.0002	0	0	0	0	.0003
Zr	0	0	0	0	0	.007
			Partial norms			
Calcite	27.1	2/	2/	81.5	2/	3.9
Dolomite	8.2	2/	2/	8.7	2/	5.0
Gypsum	1.1	3/ 42	3/ 59	1.0	100	.3
Apatite	4/ 56.0	5/ 44	5/ 36	3.9	2/	1.5

1/ Coordinates are those of the Puerto Rico rectangular coordinate system; locations are reported to the nearest 10 m.

2/ Minor or trace: not calculated.

3/ Approximate because SO_3 values vary.

4/ Probably largely hydroxylapatite [$Ca_5(PO_4)_3(OH)$] (Kaye, 1959, p. 159).

5/ Approximate because computation of normative gypsum leaves excessive P_2O_5 for computation as hydroxylapatite alone. Probably contains in addition crandallite [$CaAl_3(PO_4)_2(OH)_5 \cdot H_2O$], martinite [hydrous and carbonate-bearing variety of whitlockite $Ca_3(PO_4)_2$], brushite [$CaHPO_4 \cdot 2H_2O$], and(or) other phosphate minerals (Kaye, 1959, p. 157-162).

Sample M-23B. Carbonate-bearing phosphorite. Well indurated.

G-3, G-4. Gypsiferous phosphorite. Friable; volatiles other than H_2O and CO_2 may be contained in nitrates or organic compounds.

I-11. Phosphatic magnesian limestone concretions.

I-12. Gypsum from a roof encrustation. For comparison, pure gypsum [$Ca(SO_4) \cdot 2H_2O$] is composed (in percent) of CaO = 32.5; SO_3 = 46.5; H_2O = 20.93 (Palache and others, 1951, p. 484).

M-32. Aluminous lateritic red earth. Remainder chiefly clay minerals and hydrous iron oxides. Ratio $Al_2O_3+Fe_2O_3:SiO_2$ = 1.03. Volatiles other than H_2O and CO_2 probably chiefly contained in organic