

### Mineralogical Chemistry.

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**Sodium Fluoride in Nepheline-Syenite from Los Islands.**  
ALFRED LACROIX (*Compt. rend.*, 1908, 146, 213—216).—The Los Islands, off the West Coast of Africa, are composed entirely of nepheline-syenites, which vary from fine-grained to pegmatitic in texture, and contain the

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SiO <sub>2</sub> .	Al <sub>2</sub> O <sub>3</sub> .	CaO.	MgO.	Na <sub>2</sub> O.	K <sub>2</sub> O.	$\frac{\text{H}_2\text{O.}}{<110^\circ.}$	$\frac{\text{H}_2\text{O.}}{>110^\circ.}$	CO <sub>2</sub> .	Cl.	Total.	Sp. gr.
54.11	0.64	24.84	5.54	6.63	0.21	1.78	5.32	0.82	trace	99.89	2.688

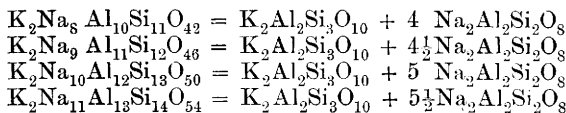
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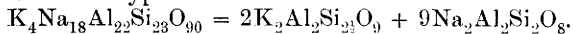
D 2.631 (not allowing for 12% of enclosed albite). II, a large mass of elæolite also from mariupolite, with 9.8% insoluble material (albite, ægirite, beckelite, &c.). III, grains of red elæolite from mariupolite, enclosing 50% of perthite and hæmatite. IV, elæolite from Mias, Urals; D 2.645; the powdered mineral gives an alkaline reaction in water, and, after digestion for twelve hours, 0.45% is dissolved. V, well-formed crystals of nepheline from Vesuvius; D 2.64. VI, small, prismatic crystals from Vesuvius, with 0.5% insoluble enclosures:

	SiO <sub>2</sub> .	TiO <sub>2</sub> .	Al <sub>2</sub> O <sub>3</sub> .	Fe <sub>2</sub> O <sub>3</sub> .	CaO.	MgO.	K <sub>2</sub> O.	Na <sub>2</sub> O.	H <sub>2</sub> O.	Total.
I.	43.65	0.10	33.12	0.48	0.49	—	5.69	15.91	0.74	100.18
II.	43.46	0.07	32.82	0.75	0.31	—	5.55	16.12	0.89	99.97
III.	43.55	0.03	32.96	0.66	0.25	—	6.09	16.00	0.33	99.86
IV.	42.71	0.04	33.83	0.40	0.32	trace	5.86	16.46	0.18	99.86
V.	42.53	0.01	33.92	0.30	1.97	0.07	5.82	15.12	0.13	100.11
VI.	43.34	trace	33.75	0.50	2.20	0.24	4.34	15.66	0.23	100.26

In all these analyses, the molecular ratio of (Al,Fe)<sub>2</sub>O<sub>3</sub>:(Na<sub>2</sub>,K<sub>2</sub>,Ca)O = 1:1; but the ratio of (Si,Ti)O<sub>2</sub>:(Al,Fe)<sub>2</sub>O<sub>3</sub> varies from 2.11:1 to 2.21:1 (being 2.21:1 in analyses I—III). The ratio of K<sub>2</sub>O:(Na<sub>2</sub>O+CaO) varies from 1:4.06 to 1:5.6, being usually 1:4.4. These and previous analyses are discussed in detail, and evidence is adduced to show that potassium (which is invariably present in nepheline) and sodium do not replace each other isomorphously. Most analyses may be referred to the following series of normal nephelines:



These formulæ represent double compounds of a potassium aluminotrisilicate (comparable with the silicate portion of sodalite, &c.) with a sodium aluminodisilicate (analogous to natrolite minus water). A few analyses (amongst them IV and V now given) represent a slightly more basic type with the formula



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**Mineralogy of Iron Mine Hill, Rhode Island.** B. L. JOHNSON and CHARLES HYDE WARREN (*Amer. J. Sci.*, 1908, [iv], 25, 1—38).—In an account of the geology and petrography of Iron Mine Hill, near Cumberland in Rhode Island, a detailed description is given of the ultra-basic igneous rock called cumberlandite, which consists of olivine (46%), labradorite (9%), magnetite (20½%), and ilmenite (18%), with some spinel (3½%) and metallic sulphides (1%). Analysis I of the olivine shows it to be the iron-rich variety hyalosiderite. Analysis II is of the fresh, unaltered cumberlandite. Chloritic (anal. III), actinolitic, and serpentine (anal. IV) types of alteration of the cumberlandite are distinguished. The altered rock is traversed by narrow veins of secondary minerals, which are mainly actinolite (anal. V), clinocllore, and hortonolite (VI):

	SiO <sub>2</sub>	TiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	Fe <sub>2</sub> O <sub>3</sub>	FeO	MnO	MgO	CaO	K <sub>2</sub> O	Na <sub>2</sub> O	H <sub>2</sub> O	Total	Sp. gr.
I.	37.16	0.07	—	0.12	31.38	0.40	31.16	trace	—	—	—	100.63*	3.728
II.	22.35	10.00	5.26	14.05	28.84	0.43	16.10	1.17	0.10	0.44	0.42	99.26†	3.92-4.0
III.	20.89	9.57	6.93	17.81	26.04	—	15.65	0.96	nil	trace	2.71	100.54	3.80-3.85
IV.	19.98	9.76	6.75	19.25	21.42	0.40	16.83	n. d.	trace	trace	4.77	99.32	3.56-3.65
V.	56.00	trace	1.00	0.10	7.14	0.10	20.52	14.03	trace	0.50	0.80	100.19‡	3.062
VI.	33.27	trace	—	0.37	49.32	1.50	16.08	—	—	—	n. d.	100.54	4.054

\* Also, insoluble felspar 0.34%.

† Also (not included in total), V<sub>2</sub>O<sub>5</sub>, 0.18; Cr<sub>2</sub>O<sub>3</sub>, trace; CO<sub>2</sub>, 0.02; P<sub>2</sub>O<sub>5</sub>, 0.02; S, 0.38; Zn, 0.71; Cu, 0.08; Co+Ni, 0.08; Pb, trace.

‡ Also, trace of fluorine(?).

This analysis of actinolite gives ratios agreeing closely with those of Penfield (Abstr., 1907, ii, 102). The hortonolite is a dark resinous mineral with distinct cleavages in two directions at right angles; in small fragments, it is pale yellow by transmitted light. The occurrence of this rare member of the olivine group as a secondary vein mineral is of interest.

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**The Volcano of Siroua, in the Morocco Atlas.** LOUIS GENTIL (*Compt. rend.*, 1908, 146, 185-187).—A description is given of this extinct volcano, the rocks of which belong to two series, trachytic and phonolitic. Analyses are given of a biotite-trachyte and of a haüyne-ægirite-phonolite.

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**Origin of Laterite.** JEAN CHAUTARD and PAUL LEMOINE (*Compt. rend.*, 1908, 146, 239-242).—The products of decomposition of rocks are different in temperate and in tropical regions; in the former they consist of aluminium and iron hydroxides, and in the latter of aluminium silicates (clays). The products in tropical regions consist of bauxite and laterite, which are analogous in constitution, and are of importance as ores of aluminium and iron respectively. Twelve analyses by F. Pisani are given of rocks and their decomposition products from Guinea; the following are selected as examples. I and II are of fresh diabase, and Ia and IIa of the laterite which has been derived from the same rocks:

	SiO <sub>2</sub>	TiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	Fe <sub>2</sub> O <sub>3</sub>	FeO	CaO	MgO	K <sub>2</sub> O	Na <sub>2</sub> O	P <sub>2</sub> O <sub>5</sub>	Loss on ignition.	Total.
I.	51.80	1.56	13.83	—	9.80	11.21	7.85	0.68	2.27	0.06	0.50	99.56
Ia.	12.60	3.24	34.71	22.78	1.26	0.63	0.16	0.32	0.14	—	23.70	99.54
II.	48.51	2.96	14.18	2.40	10.35	8.00	6.05	0.67	4.51	0.13	3.12	100.75
IIa.	5.52	9.05	34.10	27.13	1.26	—	0.65	0.26	0.25	—	22.50	100.72

Assuming the titanium dioxide to be the most stable and constant constituent, it will be seen from these analyses that the decomposition has resulted in the removal of the calcium, magnesium, and alkalis, a removal of about four-fifths of the silica, and a slight removal of aluminium and iron; the percentage amounts of the latter being relatively increased. The aluminium is present as minutely crystallised hydrargillite (Al<sub>2</sub>O<sub>3</sub>·3H<sub>2</sub>O), and the silica is free. The process of lateritisation therefore consists in the removal of certain constituents, and in the oxidation and hydration of others.

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**The Williamstown Meteorite.** EDWIN E. HOWELL (*Amer. J. Sci.*, 1908, [iv], 25, 49-50).—This meteoric iron was found on 25th April, 1892, near Williamstown, Grant Co., Kentucky. It weighed about 31 kilos., with D 8.1. The structure is that of a typical octa-

hedrite of medium coarseness. Bands of kamacite, t  nite, and plessite are visible on the etched surfaces, with here and there nodules of troilite, some of which enclose carbonaceous matter and are surrounded by a skin of schreibersite. Analysis by W. Tassin gave :

Fe.	Ni.	Co.	Cu.	Cr.	P.	S.	C.	Si.	Total.
91.54	7.26	0.52	0.03	0.05	0.12	0.17	0.004	trace	99.694

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**The Ainsworth Meteorite.** EDWIN E. HOWELL (*Amer. J. Sci.*, 1908, [iv], 25, 105—107).—This meteoric iron, which weighed 10.65 kilos., was found in the winter of 1906–7 near Ainsworth, in Brown Co., Nebraska. The structure is octahedral, with very wide bands on the surface of which a minute, octahedral structure is also evident. Troilite and schreibersite are present. Analysis by W. Tassin gave :

Fe.	Ni.	Co.	Cu.	P.	S.	Cr.	Si.	C.	Sp. gr.
92.22	6.49	0.42	0.01	0.23	0.07	0.01	0.05	0.09	7.85

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