

Mineralogical Chemistry.

Cobaltnickelpyrite, a New Mineral of the Pyrites Group from Müsen, Siegen Westphalia. M. HENGLEIN (*Centr. Min.*, 1914, 129—134).—This mineral occurs as confused aggregates of small cubic crystals, together with quartz, chalybite, pyrites, and copper-pyrites, in the Victoria Mine at Müsen. The crystals show the forms of the cube, octahedron, and a pentagonal-dodecahedron {320}; there is a fairly distinct cleavage parallel to faces of the cube. The colour is steel-grey with a metallic lustre, and the streak is greyish-black. $D^{19-20} 4.716 \pm 0.028$, $H 5-5\frac{1}{2}$. The mineral is decomposed by nitric acid, and when heated it gives off sulphur. Analyses lead to the formula $(Fe,Ni,Co)S_2$. In other partial analyses the iron ranges from 16 to 27.15%:

Fe.	Ni.	Co.	S.	Insol.	Total.
21.15	17.50	[6.61]	53.70	1.04	100.00
22.8	11.7	10.6	53.9	0.7	99.7

L. J. S.

Laterite and its Consideration in the Light of Colloid Chemistry. A. LUZ (*Kolloid. Zeitsch.*, 1914, 14, 81—90).—A summary is given of the views which have been put forward by different observers in regard to the nature and origin of laterite.

Specimens of laterite from Brazil and German East Africa have been examined microscopically, by means of their behaviour towards dyes, and also by determining the loss of water at different temperatures. From these observations, in combination with earlier data, it is suggested that laterite is the result of a series of changes, in which aluminium silicates containing sodium, potassium, calcium, iron and magnesium give rise in succession to (1) colloidal aluminium silicate, (2) colloidal aluminium hydroxide and silica, (3) crystalline hydrargillite, (4) crystalline diaspore. By a collateral series of changes, crystalline limonite is supposed to be formed from colloidal ferric hydroxide.

H. M. D.

Wilkeite, a New Mineral of the Apatite Group from California. ARTHUR S. EAKLE and AUSTIN F. ROGERS (*Amer. J. Sci.*, 1914, [iv], **37**, 262—267).—This mineral occurs as pale rose-red crystals in blue, crystalline limestone near a granodiorite contact at Crestmore, in Riverside Co., California. The crystals are hexagonal, with a prismatic habit and angles near to those of apatite ($a:c=1:0.730$ about); they are optically uniaxial and negative. $D^{20} 3.234$, $H 5$. The mineral is readily soluble in dilute acids with the separation of flocculent silica; and it is remarkable in containing four acid radicles. Analysis gave:

CaO.	MnO.	P ₂ O ₅ .	SO ₃ .	SiO ₂ .	CO ₂ .	H ₂ O.	Total.
54.44	0.77	20.85	12.28	9.62	2.10	trace	100.06

The formula $20CaO, 3P_2O_5, 3SiO_2, 3SO_3, CO_2$, when written in the form $3Ca_3(PO_4)_2, CaCO_3 + 3Ca_3[(SiO_4)(SO_4)], CaO$, shows a relation to the apatite formula. The wilkeite is often altered to a white, opaque mineral with a pearly lustre and fibrous structure, which was identified as okenite (hydrated calcium silicate).

L. J. S.

Chemical Composition of Aluminous Augites: an Application of Quaternary Graphical Representations. H. E. BOEKE (*Zeitsch. Krist. Min.*, 1914, **53**, 445—462).—Many (163) published analyses of aluminous augites are reduced to molecular percentages of $SiO_2 + TiO_2$, CaO, $(Al, Fe''', Cr)_2O_3$, and $(Mg, Fe'', Mn)O$, and these components are plotted along four of the sides of a regular tetrahedron. A point inside the tetrahedron thus expresses the composition given by each analysis. The whole series of points is inscribed within a solid, the form of which is shown more clearly by projections on three planes at right angles.

L. J. S.

The Melting Points of Some Japanese Minerals. YASUTARO YAMASHITA and MASAICHI MAJIMA (*Sci. Reports Tōhoku Imp. Univ.*, 1913, **2**, 175—178).—The melting points of the following Japanese minerals were determined by the heating-curve method; temperatures up to 1500° were measured with a platinum-rhodium thermocouple, and above that temperature with an optical pyrometer. The localities are given in brackets: Anorthite (Miyakojima), 1528° , (Tarumae), 1533° ; bronzite (Anijima, Ogasawara), 1459° ; andesine (Thioda, Shinano), 1333° ; oligoclase andesine (Yuōshima), 1232° ,

1257°; augite (Otomezaka, Echigo), 1074°; orthoclase-albite, 1250°, 1228°; granite, 1446°, 1478°, 1509°. T. S. P.

Ferri-allophane from the Neighbourhood of Moscow. F. A. NIKOLAEVSKI (*Bull. Acad. Sci. St. Pétersbourg*, 1914, 147—150).—The secondary dolomites immediately below the shallow band of clay adjacent to the carboniferous limestone in the neighbourhood of Moscow contain, besides colloidal crusts of allophanoids, a mineral which in its most typical and pure form possesses the form of a colloidal substance with a vitreous lustre and an irregular conchoidal fracture. At the edges it transmits a dense, dark brown light, and its hardness is 3·5, its specific gravity 2·14, and its streak yellow-ochre. It is difficult to obtain quite free from admixtures of calcium carbonate, and, allowing for this, its mean percentage composition is:

SiO ₂ .	Al ₂ O ₃ .	Fe ₂ O ₃ .	H ₂ O.	Total.
20·18	23·77	25·05	31·00	100·00

As is the case in the argillaceous allophanes, the relations between the oxides vary within somewhat wide limits approximating in the mean to the simple ratio: SiO₂:R₂O₃:H₂O=1:1:5. Such variations are often encountered in substances of colloidal structure, but these substances generally approximate to simple formulæ, since the colloidal nature of the compound does not exclude the possibility of perfectly definite, stoichiometrical relations (compare Cornu, A., 1909, ii, 222; Gans, this vol., ii, 55).

The author suggests the name *ferri-allophane* for the mineral described above. T. H. P.

Chemical Investigation of Certain Minerals from Ceylon Gravel. VI. G. P. TSCHERNIK (*Bull. Acad. Sci. St. Pétersbourg*, 1914, 103—114. Compare this vol., ii, 211).—Fine concentrates from the Sabaragamuwa Province were found to contain rounded crystals quite black on the crystal faces, but greyish-black on the rounded surfaces. Their fracture is not characteristic, but is somewhat of an imperfectly conchoidal form, and the fresh fracture shows an intense glassy lustre. No cleavage is exhibited, and the streak is dark brownish-grey. The hardness is slightly inferior to that of orthoclase, and the specific gravity 4·83, and thin sections transmit a faint reddish-brown light. Concentrated mineral acids, even when boiling, are almost entirely without action on it. The percentage composition is as follows:

FeO.	CaO.	MgO.	ThO ₂ .	U ₃ O ₈ .	K ₂ O.	Na ₂ O.	Ce ₂ O ₃ .	Y ₂ O ₃ .	WO ₃ .
7·55	10·51	0·94	7·43	0·08	0·12	1·52	17·03	0·22	trace
		SiO ₂ .	TiO ₂ .	ZrO ₂ .	Loss on ignition	Total.			
		0·16	20·77	32·17	0·47	99·02			

This composition is expressed approximately by the formula:
 $4\text{FeO}, 8\text{CaO}, \text{ThO}_2, \text{Na}_2\text{O}, 2\text{Ce}_2\text{O}_3, 10\text{ZrO}_2, 10\text{TiO}_2, \text{aq.}$, or
 $\text{ThO}_2(\text{TiO}_2)_2 + 2[\text{Ce}_2\text{O}_3(\text{TiO}_2)_3 + 4\text{CaO}, \text{ZrO}_2 + (\text{FeO})_2\text{TiO}_2] + \text{Na}_2\text{O}(\text{ZrO}_2)_2 + \text{aq.}$

The physical and chemical properties of the mineral characterise it as a modification of zirkelite, which has been found previously in Ceylon (compare Hussak and Prior, A., 1895, ii, 508; Prior, A., 1897, ii, 411).

The methods of analysis are described in detail. T. H. P.

Recognition and Determination of Combustible Gases in Mineral Waters. ENRIQUE HAUSER (*Anal. Fis. Quim.*, 1913, **11**, 515; 1914, **12**, 61—78; *Compt. rend.*, 1914, **158**, 634—637).—Methane is present in the dissolved gases of some spring waters. In the water of Zaldívar the quantity is less than 0.03 c.c. per litre.

G. D. L.
