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Mineralogical Chemistry.

Review of the Processes of Chemical Transformation in Potash Deposits. M. Rósza (*Zeitsch. anorg. Chem.*, 1915, **92**, 297—300).—A summary of the results obtained in previous papers (A., 1914, ii, 376; 1915, ii, 355, 356, 473).—A purely thermal decomposition of carnallite into KCl and $MgCl_2,4H_2O$ can only

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occur rarely, as the circulation of solution has the effect of preventing dehydration. The decomposition is actually hydrothermal.
C. H. D.

Proustite from Cobalt, Ontario. ARTHUR L. PARSONS (*Min. Mag.*, 1916, **17**, 309—313).—Analysis, by H. V. Ellsworth, of the small crystals, which were, however, imperfectly separated from impurities, gave:

Ag.	As.	S.	Sb.	Fe.	Co (+ trace of Ni).	Insol.	Total.
64·12	15·90	19·28	0·08	0·25	0·12	0·38	100·13

corresponding with proustite (Ag_3AsS_3), 94·62; pyrargyrite (Ag_3SbS_3), 3·77%; smaltite, 0·04%; pyrites, 0·05%; arsenic, 1·27%. A crystallographic description of the material is given, $a:c=1:0·8015$, and a new crystal-form recorded.
L. J. S.

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Crystallography and Dehydration of Torbernite. W. F. HALLIMOND (*Min. Mag.*, 1916, **17**, 326—339).—Torbernite is tetragonal with $a:c=1:2·974$. Refractive index, 1·591. When the crystals lose water, owing either to rise in temperature to less than 100° or to being placed in a desiccator, there is a change to metatorbernite—a crystalline form with definite optical characters. This alteration is dependent, not only on the temperature, but also on the partial pressure of aqueous vapour in the surrounding space. Torbernite was kept over sulphuric acid of various strengths (corresponding with definite vapour pressures) and at various temperatures, and afterwards examined to ascertain if the change to metatorbernite had taken place; the points when plotted fall on one or other side of the transition curve of torbernite. The mineral is stable within very narrow limits.
L. J. S.

Natrolite from Kinbane, Co. Antrim. F. N. ASHCROFT (*Min. Mag.*, 1916, **17**, 305—308).—A description is given of the occurrence of fine specimens of delicate, acicular crystals of natrolite in basalt near Kinbane (White Head) on the north coast of County Antrim. Associated minerals are calcite and analcite. Analysis gave the following results, in close agreement with the formula $Na_2O,Al_2O_3,3SiO_2,2H_2O$:

SiO_2.	Al_2O_3 (+trace Fe_2O_3).	CaO.	Na_2O.	K_2O.	H_2O.	Total.
47·22	27·21	nil	15·86	0·06	9·70	100·05

L. J. S.

Chabazite from County Antrim. G. F. HERBERT SMITH; with topographical notes by F. N. ASHCROFT and chemical analyses by G. T. PRIOR (*Min. Mag.*, 1916, **17**, 274—304).—A detailed description is given of the occurrence and crystallographic characters of chabazite and the associated minerals (calcite, analcite, natrolite, and mesolite) found in the flows of basaltic lava at various localities in County Antrim. The crystals ($a:c=1:1·0860$) are of the

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gmelinite (hexagonal) or phacolite (rhombohedral) habit, and are usually twinned on the $c(111)$ or $r(100)$ planes, or on both. Refractive indices for sodium light, $\omega=1{\cdot}490$, $\epsilon=1{\cdot}480$. Analyses I—III are of crystals of the gmelinite habit from White Head at the entrance of Belfast Lough, IV of crystals of the phacolite habit from Craigahulliar, near Portrush, and V of phacolite from Killyflugh, near Ballymena:

	SiO_2.	Al_2O_3.	CaO.	SrO.	K_2O.	Na_2O.	H_2O.	Total.	Sp. gr.
I.	46·64	20·04	7·00	0·22	0·63	3·81	21·84	100·18	2·09
II.	46·75	19·79	8·25	0·23	0·33	2·17	22·09	99·61	2·07
III.	47·81	19·73	5·01	0·02	0·31	6·13	21·56	100·57	2·06
IV.	48·61	18·06	8·19	0·60	2·13	0·33	21·68	99·60	2·09
V.	48·82	18·53	8·81	0·26	1·20	0·37	22·09	100·08	2·09

The formulæ deduced from these analyses are respectively:

I.	$12\frac{1}{2}(CaAl_2Si_4O_{12},6H_2O)$	$+\ 7(Na_2Al_2Si_4O_{12},6H_2O)$	$+H_2O$.	
II.	15 ,,	$+\ 4$,,	$+1\frac{1}{2}SiO_2$	$+9H_2O$.
III.	9 ,,	$+10$,,	$+3SiO_2$	$+6H_2O$.
IV.	15 ,,	$+\ 3(K_2Al_2Si_4O_{12},6H_2O)$	$+8SiO_2$	$+12H_2O$.
V.	16 ,,	$+\ 2$,,	$+9SiO_2$	$+15H_2O$.

The amounts of silica and water in excess over that required for the usually accepted formula of chabazite, namely,

$$(Ca,K_2,Na_2)Al_2Si_4O_{12},6H_2O,$$

may be present in solid solution, as recently suggested by Foote and Bradley (A., 1911, ii, 122; 1912, ii, 568) in the case of nephelite and analcite. This formula may be written in the form

$$(Ca,Na_2,K_2)Al_2Si_2O_8,2H_2SiO_3,4H_2O\,;$$

here the first portion represents the lime-felspar ($CaAl_2Si_2O_8$) and nephelite ($Na_2Al_2Si_2O_8$) molecules, and these may be replaceable by the alkali-felspar molecule, $(Na,K)AlSi_3O_8$.

Gmelinite and phacolite are both identical with the species chabazite, differing only in crystal habit, and the difference in the amount of soda and potash shown in the above analyses is probably without significance. L. J. S.

Gay Gulch and Skookum Meteorites, Yukon, Canada. R. A. A. JOHNSTON (*Museum Bull.*, No. 15 [*Geol. Ser.*, No. 26]; *Geol. Survey Canada*, 1915, 1—31).—These masses of meteoric iron were found in the gold-bearing gravels of Pliocene age in two of the gulches tributary to the Bonanza Creek in the Klondike district, the second of them at a depth of 65 feet below the surface. One weighing 483 grams was found in 1901 in Gay gulch (partial analysis I by H. A. Leverin), and the other, weighing 15·88 kilograms, was found in 1905 in Skookum gulch (anal. II). They are both nickel-rich irons showing a similarity in structure (coarse octahedral with chatoyant reflections on the etched surfaces, nodules of troilite, etc.), and they probably belong to the same meteoritic shower dating back to the Tertiary period.

	Fe.	Ni.	Co.	Cr.	C.	P.	S.	Si.	Total.	Sp. gr.
I.	83·85	15·03	—	—	—	—	—	—	—	7·566
II.	80·65	18·20	0·91	0·002	0·015	0·194	0·002	0·003	99·976	7·561

L. J. S.

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Summation of Chemical Analyses of Rocks. H. H. ROBINSON (*Amer. J. Sci.*, 1916, [iv], **41**, 257—275).—Although the sum of the results obtained in the complete analysis of a rock should be 100%, such is rarely the case. Inspection of the 3391 analyses recorded by Washington (*Bull. U.S. Geol. Survey*, Nos. 14 and 28, 1903, 1904) shows that the sum is more frequently above 100 than below; in 1253 cases the sum varied from 99% to 99·99%, and in 1846 it lay between 100 and 100·99%. The author discusses the question in general, showing that the errors are usually due to want of skill on the part of the analyst, and not particularly to the untrustworthiness of the methods employed. W. P. S.

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