purity, and it appears at present as if the only plan would be to use a chemically pure nickel crucible in making it, for no crucible will withstand the action of fused sodium dioxide. Porcelain, iron, silver, gold and platinum crucibles are rapidly attacked.

The presence of water in this compound seems curious, but it may be due to the presence of sodium hydroxide in the sodium dioxide. Again it may be due to the water added to dissolve the soluble residue from the crystals. The first explanation seems to be the more plausible since the crystals are formed in the mass while it is fused, and they are not produced upon the addition of the water. If such is the case it would seem that the water driven off between 130° C. and 240° C. is from the breaking down of a true hydrate, rather than the expulsion of water of crystallization.

A cobalto-cobaltic hydrate, $Co_3O_4.2H_2O$, has been described,[1] but it was obtained by exposing to moist air, Co_3O_4, prepared by heating cobalt carbonate. Ni_3O_4, prepared by heating nickelo-nickelic hydrate to 240° C. is hygroscopic and absorbs about seven and four-tenths per cent. of water from the air at 30° C., which is completely lost at 110° C., showing that no hydrate is formed under these conditions.

The study of the action of fused sodium dioxide on the metals will be continued here, and it is hoped that some more data can be contributed soon.

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TABLE OF FACTORS.

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ATOMIC masses, based on O = 16, taken from an article by F. W. Clarke, this Journal, March, 1896.

	Required.	Factor.	Logarithm.
$AlPO_4$	Al.	0.221976	$\bar{1}$.3463071
	Al_2O_3.	0.418489	$\bar{1}$.6216835
Sb_2O_4	Sb.	0.790067	$\bar{1}$.8976643
Sb_2S_3	Sb.	0.714570	$\bar{1}$.8540446
As_2S_3	As.	0.609522	$\bar{1}$.7849890
$Mg_2As_2O_7$	As.	0.483268	$\bar{1}$.6841870
Ag_3AsO_4	As.	0.162234	$\bar{1}$.2101418
$BaSO_4$	BaO.	0.657088	$\bar{1}$.8176234

1 Genth and Gibbs: *Am. J. Sci.*, 23, 257.

	Required.	Factor.	Logarithm.
	SO_3.	0.342912	$\bar{1}$.5351829
	S.	0.137342	$\bar{1}$.1378121
Bi_2O_3	Bi.	0.896600	$\bar{1}$.9525990
$CaCO_3$	CaO.	0.560296	$\bar{1}$.7484173
$CaSO_4$	CaO.	0.411899	$\bar{1}$.6147904
	$CaCO_3$.	0.735145	$\bar{1}$.8663731
CO_2	C.	0.272893	$\bar{1}$.4359916
Cr_2O_3	Cr.	0.684791	$\bar{1}$.8355581
$3K_2SO_4.2CoSO_4$	Co.	0.141511	$\bar{1}$.1507892
CuO	Cu.	0.798995	$\bar{1}$.9025440
Cu_2S	Cu.	0.798644	$\bar{1}$.9023531
Fe_2O_3	Fe.	0.700076	$\bar{1}$.8451446
Fe	Fe_2O_3.	1.42842	0.1548554
	FeO.	1.28561	0.1091100
	Fe_3O_4.	1.38082	0.1401359
$PbCrO_4$	Pb.	.640500	$\bar{1}$.8065193
$PbSO_4$	Pb.	.682927	$\bar{1}$.8343742
$Mg_2P_2O_7$	P.	.278681	$\bar{1}$.4451076
	P_2O_5.	.638038	$\bar{1}$.8048465
	MgO.	.361962	$\bar{1}$.5586631
	$MgCO_3$.	.757343	$\bar{1}$.8792934
Mn_3O_4	Mn.	.720490	$\bar{1}$.8576283
$Mn_2P_2O_7$	Mn.	.387226	$\bar{1}$.5879648
$(NH_4)_2PtCl_6$	Pt.	.439205	$\bar{1}$.6426669
	N.	.063281	$\bar{2}$.8012744
	NH_3.	.076911	$\bar{2}$.8859881
	NH_4Cl.	.241235	$\bar{1}$.3824396
Pt from $(NH_4)_2PtCl_6$	N.	.144081	$\bar{1}$.1586075
	NH_3.	.175114	$\bar{1}$.2433212
	NH_3Cl.	.549253	$\bar{1}$.7397727
K_2PtCl_6	KCl.	.306951	$\bar{1}$.4870695
	K_2O.	.193944	$\bar{1}$.2876767
KCl	K_2O.	.631840	$\bar{1}$.8006072
K_2SO_4	K_2O.	.540593	$\bar{1}$.7328706
SiO_2	Si.	.470199	$\bar{1}$.6722814
AgBr	Br.	.425560	$\bar{1}$.6289611
AgI	I.	.540313	$\bar{1}$.7326479
AgCl	Cl.	.247262	$\bar{1}$.3931579
	Ag.	.752738	$\bar{1}$.8766436
NaCl	Na_2O.	.530769	$\bar{1}$.7249057
Na_2SO_4	Na_2O.	.436801	$\bar{1}$.6402836
SnO_2	Sn.	.788150	$\bar{1}$.8966087
TiO_2	Ti.	.600749	$\bar{1}$.7786928
ZnO	Zn.	.803464	$\bar{1}$.9049663
$Zn_2P_2O_7$	Zn.	.429115	$\bar{1}$.6325737
$ZnNH_4PO_4$	Zn.	.366438	$\bar{1}$.5640011