# CHAMBERS'S BDUCATIONAL COURSE—EDITED BY W. AND R. CHAMBERS.

# CHEMISTRY

BY GEORGE WILSON, M.D. F.R.S.E.
PROFESSOR OF TECHNOLOGY IN THE UNIVERSITY OF EDINBURGE.





WILLIAM AND ROBERT CHAMBERS, LONDON AND EDINBURGH. 1860.



1933. 4.8

I.

				100									200-00
													PAGE
Introduction, -		-		•		•		•		-		-	7
GENERAL PROPERTIE				0.00	•_		-		-		•		16
WRIGHT-SPECIFIC G		ITY-	-A	KOI	IC 1	N RI	GHT	•		-		•	20
CHEMICAL AFFINITY,			-	040	-		-		•				24
LAWS OF COMBINING	Pro	POR:	rion	,		-		•		•		-	29
ATOMIC THEORY,	•		•		-		7.		•		90		39
CHEMICAL NOMENCLA	TUR	E,		•		-		•		-		•	45
CHEMICAL NOTATION,			•		•		•		•		-		54
LAW OF GASEOUS VO	LUM	25,		•		-		•		-		-	58
HEAT AND ITS CHEMI	CAL	REL	ATI(	ons-									
Expansion,	-		-		-		-		•		-		64
The Thermom	eter,	-		-		-		-		-		-	66
Specific Heat,			•		•		-		•		•		69
Propagation of	He	at—	ě										
Conduc				-		•		•		•		-	73
Convect		(2)			•		-		-		-		74
Radiati		-		•		-		-		•		-	77
Latent Heat-	500												
Heat of		uidi	ty.	-		-		•		•		-	78
Heat of	_			apo	rise	tior	1.		•		-		82
		•		•			•						
CRYSTALLISATION AND	CR.	YST/	LLC	)GR	APH	Y.		~		•			87
				II									•••
INORGANIC CHEMISTE	~	-				-		_		•		-	91
200 - 100 -	.1,	100	2		•				•		•		91
Oxygen, -	•	100.00			1722	_				•		-	101
Hydrogen, -			1520	( ·	_	10 <del>-10</del> 1	101	V. 1944)					109
Nitrogen,				628		024	_	-		-		-	111
The Atmosphe	70	•		•				909			•		114
Diffusion of G			-		^ <u>-</u> -	_							-47
Compounds of			n a	na ,	UX	Ren		-		-		-	118
Nitrie A	Acid,	)		•		•		7.00		<del>45</del> .0			110

							CAUK
	Nitrous Oxide,		-	-		•	121
	Nitric Oxide—Hyponitrous Aci	id-	Nitro	us Ac	eid.		123
	Carbon,		•	•			126
	Carbonic Acid,		_		_		128
	Carbonie Oxide,		•	_		-	133
	Compounds of Carbon and Hydrogen-	_				_	100
	Heavy Carburetted Hydrogen,			_			135
	Light Carburetted Hydrogen,			1600	_	_	137
	Coal-Gas,	<del></del>	_		_	7 <u>24</u> 0	138
	Davy Lamp,	2	_	(S=T,)	_	35 <del></del>	138
	Structure of Flame,	_		_	_	1922	142
	The Blowpipe,		<u>20</u>	10.77	_	1000	145
	Boron,	###C			_	792	147
	Boracic Acid,	<u>14</u> 23	_		1223	-	148
	Silicon,	(C)	_				149
	Silica or Silicie Acid,			•			
	Sulphur,	•			-		150
	Sulphurous Acid, -			•		•	151
	Sulphuric Acid,	•			•		153
	Sulphuretted Hydrogen,			;. <del></del>		•	155
	Selenium,	•	(F				158
	Phosphorus,		•	88		•	161
		•			•		162
	Compounds of Phosphorus with Oxygo Oxide of Phosphorus,	en-					• • •
	144 4 5 5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		•	-		•	164
	Hypophosphorous Acid, -	•	•		-		164
	Phosphorous Acid,		•			•	165
	Phosphoric Acid,	•	•		-		166
	Phosphuretted Hydrogen, -		•			•	167
,	Chlorine,	-			•		169
	Hydrochloric Acid, -		•	-		•	174
	Oxides of Chlorine,	•	•		•		176
	Iodine,			•		•	180
	Bromine,	•	si •	100			185
•	Fluorine,			•		•	187
	Theory of Acids and Salts,	•	•		•		191
META	LLIC ELEMENTS—		9		20		<b>S</b>
	General Observations,		•	•		•	194
	General Properties of the Metals,	•	•		•		195
	Chemical Relations of the Metals, -		•	. •		•	197
	Divisions of the Metals into Classes,	•			•		199
	Metals of the Alkalis,		• .	•	2 8	•	200
	Potassium,	•	. •		•		200
	Sodium,		•	•		•	205

											-	PAGE
Ammonia and other	er C	omp	oun	ds (	of H	ydr	oge	n ar	nd N	litro	gen	, 208
Metals of the Alka	line	Ear	ths-									
Calcium,	-		•		-		•		•		•	215
Magnesium,		•		•		•		•		-		219
Barium,	•		•		•		•		-		•	221
Strontium,				•		•		•		-		222
Metals of the Eart	hs P	rope	er-	•								
Alumina or	Alu	mini	um	, -		•		•		•		225
Chromium,	-		•		-		-		•		-	230
Heavy Metals, or	Meta	ds P	rop	er.	Fi	rst	Div	KOIRI	a: ]	Met	alis	
not Precipital												
Solutions-			•					(Alexa)				
Zinc,					-				•		•	232
Iron, -		-		-		•		-		-		235
Compo	unds	of ]	Iron	L	•						-	239
Salts of				-	Iror	1_		•		-		241
Manganese,		-	•						-		•	243
Cobalt and		el		_		-						245
IL Metals Precipit		•	nln	hur	otto	ан	vdr	nere i	n 100	het]	107	
their Solution												
Copper, -	9 61		WW.	<b></b> , .		-, -		-	40			246
Lead.	_	125		1998		8276	_	0093	-0	:		248
· Oxides	of I	hea			_	-	-	_		_		249
Silver,	-	ovar.	,	-	_	Ξ.		(F)		2.550		250
Mercury, -	_	_		_	2000	_	50 <del>-0</del> 00	_	89 <del>75</del> 17	-	2000	252
Bismuth,			25%		220	-	3 <u>0-0</u> 78	-	<u> 22</u> 8	_		256
Cadmium,	<del></del> 8			00000					100 A		777.	256
	ain.	-	<b>D.</b>	-ai-	:1-4		ish	Q1.	<b></b>		<b>.</b> A	200
III. Metals which							1611	ow	hina	rett	eu	
Hydrogen in	AIKA	ппе	501	utic	)115-	_						Ote
Gold,			•	5	•		•				•	256
Platinum,		•		-		•		•		1870		257
Tin,	-		•		•		-		•		•	258
Antimony,		•		•		•		•		•		259
Arsenic,	•		•		•		•		•		•	261
•			III	[.								
. w.o. Carmenana		7020		236		00000		7/20		22/8		266
ANIC CHEMISTRY, -	1	- 		- - 1-0	:	100	e e	4				200
Non-azotised or A	myı	ace0	rus .	FIII	ıcıb	162 (	OI E	00Œ				000
Gum,	•		-		•		•		•		•	269
Lignine, -		•				•		•		•		270
Starch,	•		•		-		•	5000	•	98240	•	271
Sugar, -	_!	v	<b>.</b>	۔ 1_1		• • 17	٤.,	•		•		274
Azotised or Albumen—				1000			oa-					971
Albumen-	-r1D	ane	Anc	1 (3	<b>.5611</b>	16-	-				0.60	~ ( (

			•		7 - V 4 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -		. 11			~.				PAGE
Keis	tion of the		1155.3					mn	lotti	Co	nati	zier	its	
	to the S						<b>g</b> —							
	Nutrit		The second second			•				-		•	-17550	280
Proc	ducts of											my.	<b>la-</b>	
	ceous Pr	1000					id i	ts D	eriy	ativ	<b>C8</b> ,			281
	Alcoh							-		-		•		281
	Ether			pot	inde	of	Eth	yle,	•		•		-	<b>283</b>
	Acetic					-				-				285
	Chlore	-	1		-		•		•		-		•	287
Veg	etable A	eids—						`						
	Tartar	ic Ac	i <b>đ</b> ,		•		•		•		•		•	288
	Citric	Acid,	,	-		-		-		-		-		288
	Malic	Acid,					-		•		-		•	289
	Oxalio	Acid	l,	-				-	123	•		-		289
	Benzo	ic aci	d,		•		•		•	(I) <b>•</b> (I)	-		-	289
	Tanni	c, Gal	lio,	and	Py	roga	llic	Aci	ds,	_				289
Veg	etable Al				355.05	2.000								
80 SS <b>-4</b> 0	Conia.						ine,		•		r.		-07	290
	Stryck			•					eine			-		290
	Morph			10.00		***	•		-					290
	Quina			-		_	8	· _		•		-		291
Oils	and Fat	1000000		,				2						
	Fixed		-		-		•	Ó	•				•	292
2.0	Volati			_		•		-		-				294
Colo	uring M				•									
	Blue-			llov	<b>7</b> .		_		-		_		_	296
Com	pound S				' '	020	53		26	_	882			297
	Cyano		_	,					_	-	-	( <del>1.5.</del> )	_	297
	Hydro	1000	ο A.	5in		20 2 <u>22</u> 0		1221	_	122	7	126		299
	Oxide	5660)			(	 '\	io	Dal.	min	:		_ 	_	233
		ric Ac	10.			Jyaı	110,	run	шш	TG, s	aid i	Cya	TI-	901
	7.020.0		•		-				•		•		•	301
	Ferro		_	•		-				1 <del></del> ).		•		302
	Ferrid	10000		•	-		-		•		-		-	303
	Sulpho	ocyan	ogen	,		-		•		•		•		303
					7 <u>2</u> -2									
pe seg identifications on the					IV	•								
Electro-C	HEMISTR	Y,	-		-		•		•		•		•	305
INDEX.	•			-		-		•		•		-		317