L3-CHEMR





Level 3 Chemistry 2022

RESOURCE BOOKLET

Refer to this booklet to answer the questions in your Question and Answer Booklets.

Check that this booklet has pages 2–3 in the correct order and that none of these pages is blank.

YOU MAY KEEP THIS BOOKLET AT THE END OF THE EXAMINATION.

Formulae for 91390: Demonstrate understanding of thermochemical principles and the properties of particles and substances

$$n = cV$$

$$n = \frac{m}{M}$$

$$q = mc\Delta T$$

$$\Delta_{r}H^{\circ} = \frac{-q}{n}$$

$$\Delta_{r}H^{\circ} = \sum \Delta_{f}H^{\circ}(\text{products}) - \sum \Delta_{f}H^{\circ}(\text{reactants})$$

Formulae for 91392: Demonstrate understanding of equilibrium principles in aqueous systems

pH =
$$-\log[H_3O^+]$$
 [H_3O^+] = 10^{-pH}
 $K_w = [H_3O^+][OH^-] = 1 \times 10^{-14}$ at 25 °C
p $K_a = -\log K_a$ $K_a = 10^{-pK_a}$
 $K_a = \frac{[H_3O^+][A^-]}{[HA]}$
 $K_s = s^2$ $K_s = 4s^3$
 $n = cV$
 $n = \frac{m}{M}$

Complex ions for 91392: Demonstrate understanding of equilibrium principles in aqueous systems

$[Ag(CN)_2]^-$	$[Ag(NH_3)_2]^+$
[Al(OH) ₄] ⁻	[Cu(NH ₃) ₄] ²⁺
[Pb(OH) ₄] ²⁻	[Zn(OH) ₄] ²⁻
$[Zn(NH_3)_4]^{2+}$	$[Ni(NH_3)_6]^{2+}$
[Ni(CN) ₄] ²⁻	

PERIODIC TABLE OF THE ELEMENTS

									_												
18	2	He	4.0	10	Ne	20.2	18	Ar	40.0	36	Kr	83.8	54	Xe	131	98	Rn	222	118	Og	
			17	6	Έ.	19.0	17	C	35.5	35	Br	79.9	53	Ι	127	85	At	210	117	L	
			91	8	0	16.0	16	S	32.1	34	Se	79.0	52	Te	128	84	Po	210	116	Lv	
			15	7	Z	14.0	15	Ь	31.0	33	As	74.9	51	$\mathbf{S}\mathbf{p}$	122	83	Bi	209	115	Mc	
			14	9	C	12.0	14	Si	28.1	32	Ge	72.6	50	\mathbf{Sn}	119	82	Pb	207	114	F	
			13	5	В	10.8	13	Al	27.0	31	Са	2.69	49	In	115	81	I	204	113	Nh	
									12	30	Zn	65.4	48	Cd	112	80	Hg	201	112	Cn	277
									II	29	Cu	63.6	47	Ag	108	79	Au	197	1111	Rg	272
		mass							0I	28	Z	58.7	46	Pd	106	78	Pt	195	110	Ds	271
		Relative atomic mass							6	27	Co	58.9	45	Rh	103	77	Ir	192	109	Mt	268
		Relativ							8	26	Fe	55.9	44		101	92	Os	190	108	Hs	265
	1	Η	1.0						_	25	Mn	54.9	43	Tc	6.86	75	Re	186	107	Bh	264
	umber								9	24	Cr	52.0	42	Mo	95.9 98.9	74	*	184	106	S	263
	Atomic number								ς,	\sim 1	>	50.9	41	NP	92.9	73	$\mathbf{L}_{\mathbf{a}}$	181	105	Dp	262
	,								4	22	Ξ	47.9	40	\mathbf{Zr}	91.2	72	Ht	179	104	Rf	261
										21	Sc	45.0	39	X	88.9 91.2	71	Lu	175	103		262
			2	4	Be	9.0	12	$M_{\mathbf{g}}$	24.3	20	Ca	40.1	38	Sr	87.6	99	Ba	137	88	Ra	226
			I	3	Li	6.9	11	Na	23.0	19	X	39.1	37	Rb	85.5	55	C	133	87		223

	57	58	59	09	61	62	63	64	65	99	<i>L</i> 9	89	69	70
Lanthanide	La	Ce	Pr	Nd	Pm	Sm	Eu	РS	$\mathbf{T}\mathbf{b}$	Dy	Ho	Er	Tm	ΛP
Series	139	140	141	144	147	150	152	157	159	163	165	167	169	173
	68	06	91	92	93	94	95	96	26	86	66	100	101	102
Actinide	Ac	Th	Pa	n	dN	Pu	Am	Cm	Bk	Ct	Es	Fm	Md	No
Series	227	232	231	238	237	239	241	244	249	251	252	257	258	259