TEHRAN INTERNATIONAL & ADAPTIVE SCHOOL Since 1993	In the Name of God				STAMP
	Exam Subject	Chemistry	Second Term (Dec 2022 - Jan 2023)		
	Student Name		Number of Pages	4	
	9th Grade	A ☐ / B ☐	Number of Questions	8	
			Exam Time	90 min	
	Seat Number		Instructor	Ghezelbash	

EXAM INSTRUCTIONS

1. As questions have different part, please pay attention to each part and do not miss it.
2. Do not forget to write your full name and please write with nice handwriting.
3. Please consider that you are not allowed to use calculator or any types of smart devices.

QUESTIONS	Mark

1- Complete the following sentences. — 4

The formula of molecules tells us how many..... of each kind are in molecule. The formula of a compound can be worked out using.....

2- Draw the atomic structure for each of the following element:

a) ${}^{12}_{6}C$ — 3

b) ${}^{23}_{11}Na$ — 3

3- Complete the following table. — 8

Atom	He	Cl	N	
Atomic number	2			18
Mass number	4			40
Number of protons		17		
Number of neutrons		18	7	
Number of electrons				18

4- Give the symbol of each element: — 7

a) At the top of group 7

b) In group 3, period 3

c) One of the transition metals

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d) One of the halogens

e) One of the alkali metals

f) In group 4, period 2

g) One of the noble gases

h) In group 2, period 7

5- Balance each of the following reactions: 4

a) $C_2H_6 + O_2 \rightarrow CO_2 + H_2O$

b) $SO_2 + O_2 \rightarrow SO_3$

c) $NH_3 + O_2 \rightarrow NO + H_2O$

d) $Fe + Cl_2 \rightarrow FeCl_3$

6- State which group of the periodic table the following elements belong in. 6

a) Element X is a reactive non-metal solid consisting of X_2 molecules.

b) Element Z is an unreactive gas

c) An element which is brittle but shiny

7- Write the formula for the following compounds: 10

a) Iron (II) chloride

b) Hydrogen sulphide

c) Copper (I) bromide

d) Nitrate ion

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e) Hydro chloric acid

f) Aluminum sulphate

g) Dinitrogen trioxide

h) Sulphuric acid

i) Sulphur dioxide

j) Potassium carbonate

8- Explain why atoms are neutral.

a) Explain why the nucleus contains most of the mass of the atom.

5

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hydrogen 1 H 1.0079																	helium 2 He 4.0026
lithium 3 Li 6.941	beryllium 4 Be 9.0122											boron 5 B 10.811	carbon 6 C 12.011	nitrogen 7 N 14.007	oxygen 8 O 15.999	fluorine 9 F 18.998	neon 10 Ne 20.180
sodium 11 Na 22.990	magnesium 12 Mg 24.305											aluminium 13 Al 26.982	silicon 14 Si 28.086	phosphorus 15 P 30.974	sulfur 16 S 32.065	chlorine 17 Cl 35.453	argon 18 Ar 39.948
potassium 19 K 39.098	calcium 20 Ca 40.078	scandium 21 Sc 44.956	titanium 22 Ti 47.867	vanadium 23 V 50.942	chromium 24 Cr 51.996	manganese 25 Mn 54.938	iron 26 Fe 55.845	cobalt 27 Co 58.933	nickel 28 Ni 58.693	copper 29 Cu 63.546	zinc 30 Zn 65.39	gallium 31 Ga 69.723	germanium 32 Ge 72.61	arsenic 33 As 74.922	selenium 34 Se 78.96	bromine 35 Br 79.904	krypton 36 Kr 83.80
rubidium 37 Rb 85.468	strontium 38 Sr 87.62	yttrium 39 Y 88.906	zirconium 40 Zr 91.224	niobium 41 Nb 92.906	molybdenum 42 Mo 95.94	technetium 43 Tc [98]	ruthenium 44 Ru 101.07	rhodium 45 Rh 102.91	palladium 46 Pd 106.42	silver 47 Ag 107.87	cadmium 48 Cd 112.41	indium 49 In 114.82	tin 50 Sn 118.71	antimony 51 Sb 121.76	tellurium 52 Te 127.60	iodine 53 I 126.90	xenon 54 Xe 131.29
caesium 55 Cs 132.91	barium 56 Ba 137.33	57-70 *	lutetium 71 Lu 174.97	hafnium 72 Hf 178.49	tantalum 73 Ta 180.95	tungsten 74 W 183.84	rhenium 75 Re 186.21	osmium 76 Os 190.23	iridium 77 Ir 192.22	platinum 78 Pt 195.08	gold 79 Au 196.97	mercury 80 Hg 200.59	thallium 81 Tl 204.38	lead 82 Pb 207.2	bismuth 83 Bi 208.98	polonium 84 Po [209]	astatine 85 At [210]	radon 86 Rn [222]
francium 87 Fr [223]	radium 88 Ra [226]	89-102 **	lawrencium 103 Lr [262]	rutherfordium 104 Rf [261]	dubnium 105 Db [262]	seaborgium 106 Sg [266]	bohrium 107 Bh [264]	hassium 108 Hs [269]	meitnerium 109 Mt [268]	ununnilium 110 Uun [271]	unununium 111 Uuu [272]	ununbium 112 Uub [277]	nihonium 113 Nh [284]	flerovium 114 Fl [289]	moscovium 115 Mc [288]	livermorium 116 Lv [293]	tennessine 117 Ts [294]	oganesson 118 Og [294]

*Lanthanide series	lanthanum 57 La 138.91	cerium 58 Ce 140.12	praseodymium 59 Pr 140.91	neodymium 60 Nd 144.24	promethium 61 Pm [145]	samarium 62 Sm 150.36	europium 63 Eu 151.96	gadolinium 64 Gd 157.25	terbium 65 Tb 158.93	dysprosium 66 Dy 162.50	holmium 67 Ho 164.93	erbium 68 Er 167.26	thulium 69 Tm 168.93	ytterbium 70 Yb 173.04
**Actinide series	actinium 89 Ac [227]	thorium 90 Th 232.04	protactinium 91 Pa 231.04	uranium 92 U 238.03	neptunium 93 Np [237]	plutonium 94 Pu [244]	americium 95 Am [243]	curium 96 Cm [247]	berkelium 97 Bk [247]	californium 98 Cf [251]	einsteinium 99 Es [252]	fermium 100 Fm [257]	mendelevium 101 Md [258]	nobelium 102 No [259]

Good Luck	Total Mark:	50

Chemistry (Autumn 2023)