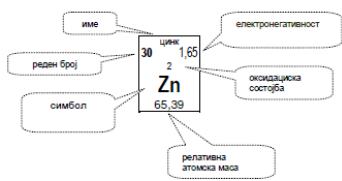


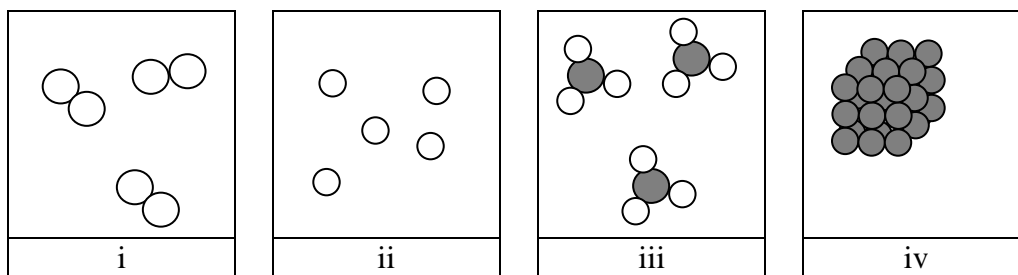
ПЕРИОДЕН СИСТЕМ НА ЕЛЕМЕНТИТЕ

1																	18						
водород 1 H 1,0079																	гелиум 2 He 4,0026						
литий 3 Li 6,941	берилиум 4 Be 9,0122																	бор 5 B 10,811	углерод 6 C 12,011	азот 7 N 14,007	кислород 8 O 15,999	флуор 9 F 18,998	неон 10 Ne 20,180
натрий 11 Na 22,990	магнезиум 12 Mg 24,305																	алуминиум 13 Al 26,982	силициум 14 Si 28,086	фосфор 15 P 30,974	сulfур 16 S 32,065	хлор 17 Cl 35,453	аргон 18 Ar 39,948
калий 19 K 39,098	калциум 20 Ca 40,078	скандиум 21 Sc 44,956	титаниум 22 Ti 47,867	ванадиум 23 V 50,942	хром 24 Cr 51,996	манган 25 Mn 54,938	железо 26 Fe 55,845	кобалт 27 Co 58,933	никел 28 Ni 58,693	бакар 29 Cu 63,546	цинк 30 Zn 65,39	галниум 31 Ga 69,723	германиум 32 Ge 72,64	арсен 33 As 74,922	селен 34 Se 78,96	бром 35 Br 79,904	критон 36 Kr 83,80						
рубидиум 37 Rb 85,468	стронциум 38 Sr 87,62	итриум 39 Y 88,906	циркониум 40 Zr 91,224	ниобий 41 Nb 92,906	молибден 42 Mo 95,94	технециум 43 Tc [98]	рутениум 44 Ru 101,07	родий 45 Rh 102,91	паладиум 46 Pd 106,42	сребро 47 Ag 107,87	кадмий 48 Cd 112,41	индий 49 In 114,82	олово 50 Sn 118,71	антимон 51 Sb 121,76	телуриум 52 Te 127,60	јод 53 I 126,90	ксенон 54 Xe 131,29						
цезиум 55 Cs 132,91	барииум 56 Ba 137,33	57-70 * лантаноиди	лутетиум 71 Lu 174,97	hafnium 72 Hf 178,49	тантал 73 Ta 180,95	вольфрам 74 W 183,84	реиниум 75 Re 186,21	осмиум 76 Os 190,23	иридиум 77 Ir 192,22	платина 78 Pt 195,08	злато 79 Au 196,97	жива 80 Hg 200,59	талниум 81 Tl 204,38	олово 82 Pb 207,2	бисмут 83 Bi 208,98	полониум 84 Po [209]	астат 85 At [210]	радон 86 Rn [222]					
франциум 87 Fr [223]	радиум 88 Ra [226]	89-102 ** актиноиди	лоренциум 103 Lr [262]	радофорениум 104 Rf [261]	дубниум 105 Db [262]	сигорениум 106 Sg [263]	бориум 107 Bh [264]	хасиум 108 Hs [265]	митнериум 109 Mt [266]	дашмштатиум 110 Ds [269]	регентриум 111 Rg [272]	копернициум 112 Cn [277]	унуквиум 113 Uuq [289]	флеровиум 114 Fl [289]	унупентиум 115 Uup [289]	ливермориум 116 Lv [293]	унуокеитиум 117 Uus [294]	унуоксетиум 118 Uuo [294]					
		лантан 57 La 138,91	церий 58 Ce 140,12	протактиниум 59 Pr 140,91	неодимиум 60 Nd 144,24	прометиум 61 Pm [145]	самариум 62 Sm 150,36	европиум 63 Eu 151,96	гадолиниум 64 Gd 157,25	тербиум 65 Tb 158,93	диспрозиум 66 Dy 162,50	холимиум 67 Ho 164,93	ербиум 68 Er 167,26	тулмиум 69 Tm 168,93	итربيум 70 Yb 173,04								
		актиниум 89 Ac [227]	ториум 90 Th 232,04	протактиниум 91 Pa 231,04	ураниум 92 U 238,03	нептуниум 93 Np [237]	пулониум 94 Pu [244]	америциум 95 Am [243]	кириум 96 Cm [247]	берклиум 97 Bk [247]	калifornиум 98 Cf [251]	эриштијум 99 Es [252]	фермиум 100 Fm [257]	менделвијум 101 Md [258]	нобелиум 102 No [259]								



Part I

1. Mark which of the following diagrams represents particles of a simple substance:



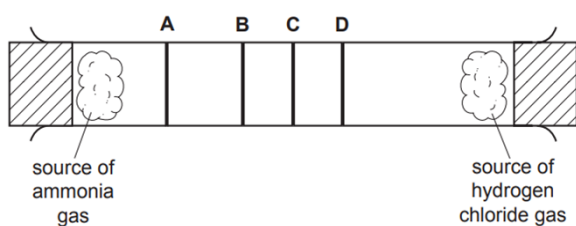
- A. Only ii
- B. Only i и ii
- C. Only iii и iv
- D. i, ii и iv

2. The boiling points of various gases present in the air are shown in the table below. If the air is cooled, the first substance to condense is water (more precisely, water vapor). If the air temperature is further lowered, what is the next substance to condense?

substance	argon	carbon dioxide	nitrogen	oxygen
$T_B / ^\circ\text{C}$	-186	-78	-198	-183

- A. Argon
B. Carbon dioxide
C. Nitrogen
D. Oxygen

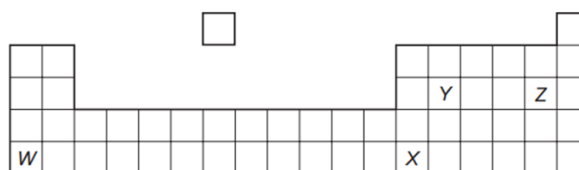
3. The diagram shows an apparatus used to compare the rate of diffusion of two gases, ammonia and hydrogen chloride. At which labeled position (A, B, C, or D) will ammonium chloride form?



- A. A
B. B
C. C
D. D

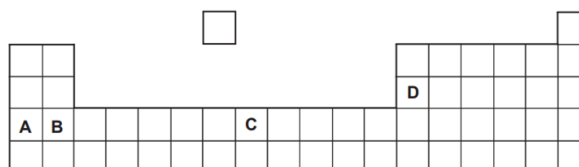
4. In designing a car frame to absorb energy during a collision, which property is crucial to prevent the frame from breaking easily?
- A. Low density
B. High malleability
C. High boiling temperature
D. High brittleness
5. Metal X forms oxides with formulae XO and X_2O_3 . Where is X located in the Periodic Table?
- A. In the second group
B. In the third group
C. In the second period
D. In transition metals

6. The diagram shows an outline of the Periodic Table. Which statement is NOT true?



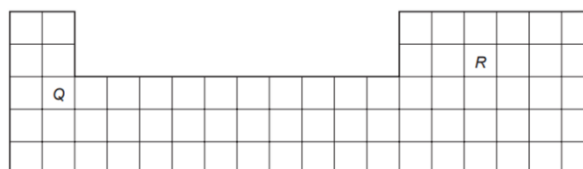
- A. W reacts very slowly with cold water.
B. W and Z could react together and form a compound of formula WZ.
C. X could form an oxide with the formula X_2O_3 .
D. Y could form an oxide with the formula YO_2 .

7. The diagram shows an outline of the Periodic Table. Element X has a high melting point and is a good conductor of electricity. It forms chlorides with formulae $XC l_2$ and $XC l_3$. In which of the indicated places (A, B, C or D) can the element X be placed?



- A. A
B. B
C. C
D. D

8. The diagram shows the location of elements Q and R in the Periodic Table. What is the formula of the compound they form?



- A. QR_2
B. Q_2R
C. Q_2R_3
D. Q_3R_2



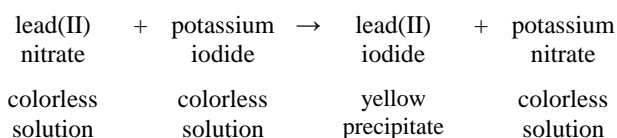
9. Sulfur and selenium are in the same group in the Periodic Table. Hence, we would expect selenium to form compounds whose chemical formulae are:

- A. SeO , Na_2Se and Na_2SeO_4
- B. SeO_2 , Na_2Se and NaSeO_4
- C. SeO_2 , Na_2Se and Na_2SeO_4
- D. SeO_3 , NaSe and NaSeO_4

10. A nonmetal X forms oxides with formulae XO_2 and XO_3 . X is:

- A. Aluminum
- B. Carbon
- C. Hydrogen
- D. Sulfur

11. The word equation is given below:



Which method is most suitable for separating the products?

- A. Sublimation
- B. Crystallization
- C. Distillation
- D. Filtration

12. A reactive metal reacts with dilute hydrochloric acid to produce a gaseous substance. What is used to identify this gas?

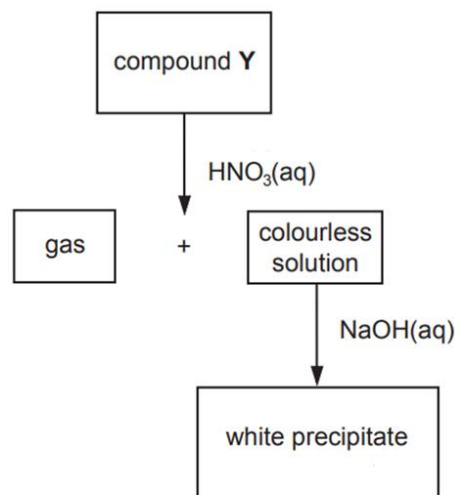
- A. A glowing splint
- B. A lighted splint
- C. Blue litmus paper
- D. Limewater

13. Which metals do NOT react with water?

- 1 calcium
- 2 copper
- 3 potassium
- 4 silver

- A. 1 and 2
- B. 1 and 3
- C. 2 and 4
- D. 3 and 4

14. Based on the scheme below, determine substance Y.



- A. Aluminum sulfate
- B. Calcium carbonate
- C. Copper(II) carbonate
- D. Zinc sulfate

15. Cesium (Cs) is an element of the first group in the Periodic Table. Which statements about cesium are true?



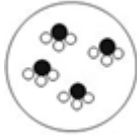



- 1 Cesium conducts electricity in both solid and liquid states.
- 2 The reaction of cesium with water is extremely violent.
- 3 Cesium reacts with water and forms a solution of $\text{pH} < 7$.

- A. Only 1 and 2
- B. Only 1 and 3
- C. Only 2 and 3
- D. 1, 2 and 3

Part II

1. Under each picture (from a to f) write the SYMBOL or FORMULA of the substance to which the diagram refers. For each picture, choose one of the following substances: iron(II) sulfide, nitrogen monoxide, gold, oxygen, ammonia, nitric acid, helium, water, hydrogen chloride.

6 points

					
a	b	c	d	e	f

2. In the table, write the necessary data, so that in the column:
 A – state the chemical symbol or formula of the corresponding substance
 B – state the chemical name of the corresponding substance
 C – indicate whether it is a simple substance or a compound
 D – specify what type of particles the corresponding substance is made of

7 points

A	B	C	D
	potassium sulfide		
Cl_2O_7			
Zn	zinc		
	magnesium nitride		
P_4			



3. Look at the corpuscular diagram (molecular representation) of the reaction between hydrogen and oxygen that forms water and answer the questions.



- I. The ratio of hydrogen to oxygen involved in the reaction where water is produced is

_____.

2 points

- II. When 4 g of hydrogen react with 32 g of oxygen, 36 g of water are formed. How many grams of water will be obtained if 4 g of hydrogen and 64 g of oxygen are available?

_____.

2 points

4. Complete the following word equations:

3 points

rubidium + water → _____

zinc oxide + nitric acid → _____

hydrobromic acid + ammonium hydroxide → _____
