

1-qism: Har bir topshiriq 0,9 balldan baholanadi

1. Suv (a), etil spirti (b) va sulfat kislota (c) berilgan. Ularni qaynash temperaturasi oshib borish tartibida joylashtiring.

- A) a-b-c B) b-a-c C) a-c-b D) c-b-a

2. Moddaning kimyoviy xossalarini o'zida saqlovchi eng kichik zarra bu - ...

- A) yadro B) atom C) molekula D) klaster

3. Avogadro doimiysining o'lchov birligi qanday?

- A) mol B) 1/mol C) g/mol D) o'lchov birligiga ega emas

4. 50 g ohaktosh parchalanganda 32,4 g qattiq qoldiq qolgan bo'lsa, parchalanmay qolgan ohaktoshning massasini aniqlang.

- A) 22,4 g B) 20,0 g C) 10,0 g D) 0,0 g

5. Gipotetik X suyuqlik ($M = 39,2$ g/mol) n.sh.da bug'langanida hajmi 1000 marta oshishi uchun qanday zichlikka (g/ml) ega bo'lishi kerak?

- A) 1,00 B) 1,25 C) 1,50 D) 1,75

6. $C + O_2 = CO_2$. Ushbu reaksiya issiqlik effektiga ko'ra qanday reaksiya hisoblanadi?

- A) Ekzotermik B) Endotermik C) Gipertermik D) Gipotermik

7. Ozon va kislorod aralashmasining o'rtacha molyar massasi 40 g/mol bo'lsa, undagi ozonning hajmiy ulushini aniqlang.

- A) 50% B) 60% C) 70% D) 80%

8. Oltinugurt bug'larining metanga nisbatan zichligi 16 bo'lsa, bug' molekularining formulasini aniqlang.

- A) S_2 B) S_4 C) S_6 D) S_8

9. Mahalliy anesteziya uchun ishlatiladigan 0,5% 80 ml lidokain eritmasini tayyorlash uchun 10% 2,0 ml lidokain ampullasidan nechta kerak bo'ladi? Har ikkala eritmaning ham zichligini 1,0 g/ml deb qarang.

- A) 1 B) 2 C) 3 D) 4

10. Temir oksidi tarkibida 72,4% temir bo'lsa, oksidning formulasini aniqlang.

- A) FeO B) Fe_2O_3 C) Fe_3O_4 D) Fe_4O_5

2-qism: Har bir topshiriq 1,5 balldan baholanadi

11. 0,1 M 10,0 ml Na_2CO_3 eritmasiga metilzarg'aldog'I qo'shildi va sariq rangli eritma hosil bo'ldi. Hosil bo'lgan eritmaga 0,1 M 10,0 ml HCl eritmasi qo'shilsa, eritma rangi qanday bo'ladi?

- A) sariq B) olovrang C) qizil D) binafsha

12. Agar tabiatda xlorning 35 va 37 izotoplari mavjud bo'lsa, Cl_2 tarkibli gaz molekularining necha foizi $^{35}Cl-^{35}Cl$ izotop tarkibga ega bo'ladi? $A_r(Cl) = 35,5$.

- A) 75,00% B) 56,25 % C) 25,00% D) 6,25%



13. 20 pg vodorod fluorid molekularini bittalab sanab chiqish uchun necha yil talab etiladi? Sanoq tezligi har sekundda 1 ta molekula. $1 \text{ pg} = 10^{-12} \text{ g}$.

- A) 458 ming B) 23 ming C) 19 ming D) 320

14. Quyidagi jadvalda Y elementning ionlanish energiyasi qiymatlari keltirilgan. Jadvaldan foydalanib, Y elementning valentligini aniqlang.

| | I ₁ | I ₂ | I ₃ | I ₄ | I ₅ | I ₆ |
|----------------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Ionlanish energiyasi | 590 | 1146 | 6978 | 8142 | 10519 | 12842 |

- A) 5 B) 4 C) 3 D) 2

15. $1s^2 2s^2 2p^6 3s^2 3p^6$ elektron konfiguratsiya qaysi zarrachaga tegishli?

- A) Ne B) Cl^+ C) S^{2-} D) Ti^{3+}

16. Sulfat kislotali muhitda kaliy yodidga 5% 500 ml ($\rho = 1,0 \text{ g/ml}$) KMnO_4 ta'sir ettirib qancha yod olish mumkin?

- A) 50 g B) 100 g C) 150 g D) 200 g

17. ^{226}Ra izotopining yarim-yemirilish davri 1600 yil. Bu 1600 yil o'tgach izotopning yarmi parchalanib, qolgan yarmi esa o'zgarishsiz qolganini bildiradi. Shu muddat ichida ^{226}Ra izotopining parchalanish tezligi qanday o'zgaradi?

- A) tezlik o'zgarmaydi B) 2 marta ortadi
C) 2 marta kamayadi D) reaksiya yakunlanib, tezlik 0 ga teng bo'ladi

18. $2\text{SO}_2 + \text{O}_2 = 2\text{SO}_3$ reaksiya uchun vanadiy(V) oksidi geterogen katalizator hisoblanadi. Katalizator ishtirokidagi reaksiyalar 2 bosqichda amalga oshadi:

1-bosqich: ...

2-bosqich: $4\text{VO}_2 + \text{O}_2 = 2\text{V}_2\text{O}_5$

Katalizatorga xos umumiy xususiyatlardan kelib chiqib 1-bosqich reaksiya tenglamasini keltiring.

- A) $2\text{V}_2\text{O}_5 = 4\text{VO}_2 + \text{O}_2$ B) $\text{V}_2\text{O}_5 + 2\text{SO}_2 = \text{V}_2\text{O}_3 + 2\text{SO}_3$
C) $2\text{VO}_2 + \text{SO}_2 = \text{V}_2\text{O}_3 + \text{SO}_3$ D) $\text{V}_2\text{O}_5 + \text{SO}_2 = 2\text{VO}_2 + \text{SO}_3$

19. Agar $\text{N}_2 + 3\text{H}_2 = 2\text{NH}_3$ reaksiya uchun muvozanat konstantasining qiymati x ga teng bo'lsa, $\frac{1}{3}\text{N}_2 + \text{H}_2 = \frac{2}{3}\text{NH}_3$ reaksiyaning muvozanat konstantasi qiymati qanday bo'ladi?

- A) $x/3$ B) $\sqrt[3]{x}$ C) x^3 D) $3 \cdot x$

20. 98% sulfat kislota hosil qilish uchun 32% 20,0 kg oleumga qancha 60% sulfat kislota qo'shish kerak?

- A) 4,84 kg B) 5,84 kg C) 6,84 kg D) 7,84 kg

3-qism: Har bir topshiriq 2,6 balldan baholanadi

21. BCl_3 molekulasida B atomlari sp^2 gibridlangan bo'lib, B-Cl bog'ining uzunligi x ga teng. BCl_3 molekulasida Cl atomlari orasidagi masofa 0,303 nm bo'lsa, x ning qiymatini aniqlang.

22. 0,025 mol noma'lum oddiy modda yoqilganda kisloroddan 1,375 marta og'ir bo'lgan 33,6 litr (n.sh.da) gaz hosil bo'ldi. Yoqilgan noma'lum oddiy moddaning kimyoviy formulasini keltiring.

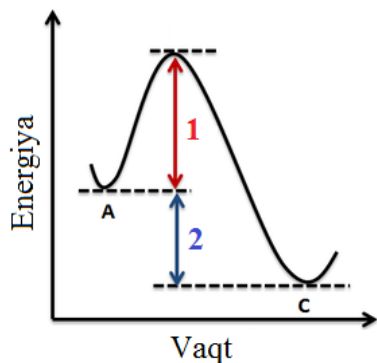


23. Asosiy holatda valent elektronlari uchun kvant sonlari: $n = 3, l = 0 (m = 0); 1 (m = -1; 0; +1)$ bo'lgan elementlarni aniqlang (shu talabga mos keluvchi barcha elementlarni ko'rsating).

24. 10 m^3 hajmli idishda 2 atm bosim 25°C temperaturada 22,9 kg qutbsiz gaz qamalgan bo'lsa, ushbu gazning kimyoviy formulasini keltiring.

25. Gipotetik reaksiyaning tezligi temperatura 20°C dan 50°C gacha ko'tarilganida 8 marta oshsa, 50°C dagi tezlikni yana 4 marta oshirish uchun temperaturani necha $^\circ\text{C}$ gacha ko'tarish kerak?

26.



Chap tomonda $A \rightarrow C$ reaksiya uchun energetik diagramma keltirilgan. 1 va 2 musbat sonlar.

Ushbu diagrammani tahlil qilib, reaksiyaning issiqlik effekti nimaga teng ekanligini 1 va 2 orqali ifodalang.

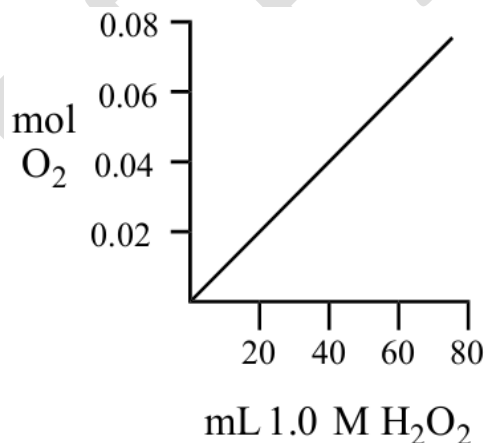
Masalan, agar 1 va 2 qiymatlarning yig'indisi demoqchi bo'lsangiz, javobni (1+2), deb yozish mumkin.

27. 3 mol A modda 3 mol B modda bilan aralashtirildi. Natijada $A + B \leftrightarrow C + D$ muvozanat o'rnatildi. Agar $K = 4$ va reaksiyon aralashma hajmi 1 litr bo'lsa, muvozanat qaror topganidan keyingi reaksiya unumini (%) aniqlang.

28. $\text{CrO}_4^{2-} + x\text{H}_2\text{O} + ye^- \rightarrow [\text{Cr}(\text{OH})_6]^{3-} + z\text{OH}^-$ yarim-reaksiyadagi x, y, z koeffisientlarni aniqlang. (uchala koeffisient to'g'ri bo'lgandagina javob inobatga olinadi).

29. Noma'lum tuz eritmasiga NaOH eritmasi qo'shilganida havodan yengil, o'tkir hidli gaz ajralishi kuzatildi. Eritmada esa faqat NaCl qolganligi ma'lum bo'lsa, noma'lum tuzning kimyoviy formulasini keltiring.

30.



Gipoxlorit ionlarini saqlovchi eritmaga 1,0 M vodorod peroksidi qo'shilsa, kislorod gazining ajralishini kuzatish mumkin.

Qo'shilgan vodorod peroksid eritmasining hajmi va ajralib chiqqan kislorodning miqdori orasidagi bog'liqlik chap tomondagi grafikda keltirilgan.

Grafikdan foydalanib, gipoxlorit ioni va vodorod peroksidi orasidagi reaksiya tenglamasini keltiring.





| | | 18 | | | | | | | | | | | | | | | |
|-------------------|-------------------|--|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| | | atomic number Symbol atomic weight | | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 1 H 1.008 | 2 He 4.003 | 3 Li 6.94 | 4 Be 9.01 | 5 B 10.81 | 6 C 12.01 | 7 N 14.01 | 8 O 16.00 | 9 F 19.00 | 10 Ne 20.18 | 11 Na 22.99 | 12 Mg 24.31 | 13 Al 26.98 | 14 Si 28.09 | 15 P 30.97 | 16 S 32.06 | 17 Cl 35.45 | 18 Ar 39.95 |
| 19 K 39.10 | 20 Ca 40.08 | 21 Sc 44.96 | 22 Ti 47.87 | 23 V 50.94 | 24 Cr 52.00 | 25 Mn 54.94 | 26 Fe 55.85 | 27 Co 58.93 | 28 Ni 58.69 | 29 Cu 63.55 | 30 Zn 65.38 | 31 Ga 69.72 | 32 Ge 72.63 | 33 As 74.92 | 34 Se 78.97 | 35 Br 79.90 | 36 Kr 83.80 |
| 37 Rb 85.47 | 38 Sr 87.62 | 39 Y 88.91 | 40 Zr 91.22 | 41 Nb 92.91 | 42 Mo 95.95 | 43 Tc - | 44 Ru 101.1 | 45 Rh 102.9 | 46 Pd 106.4 | 47 Ag 107.9 | 48 Cd 112.4 | 49 In 114.8 | 50 Sn 118.7 | 51 Sb 121.8 | 52 Te 127.6 | 53 I 126.9 | 54 Xe 131.3 |
| 55 Cs 132.9 | 56 Ba 137.3 | 57-71 | 72 Hf 178.5 | 73 Ta 180.9 | 74 W 183.8 | 75 Re 186.2 | 76 Os 190.2 | 77 Ir 192.2 | 78 Pt 195.1 | 79 Au 197.0 | 80 Hg 200.6 | 81 Tl 204.4 | 82 Pb 207.2 | 83 Bi 209.0 | 84 Po - | 85 At - | 86 Rn - |
| 87 Fr - | 88 Ra - | 89-103 | 104 Rf - | 105 Db - | 106 Sg - | 107 Bh - | 108 Hs - | 109 Mt - | 110 Ds - | 111 Rg - | 112 Cn - | 113 Nh - | 114 Fl - | 115 Mc - | 116 Lv - | 117 Ts - | 118 Og - |
| 57 La 138.9 | 58 Ce 140.1 | 59 Pr 140.9 | 60 Nd 144.2 | 61 Pm - | 62 Sm 150.4 | 63 Eu 152.0 | 64 Gd 157.3 | 65 Tb 158.9 | 66 Dy 162.5 | 67 Ho 164.9 | 68 Er 167.3 | 69 Tm 168.9 | 70 Yb 173.0 | 71 Lu 175.0 | 72 Hf 178.5 | 73 Ta 180.9 | 74 W 183.8 |
| 89 Ac - | 90 Th 232.0 | 91 Pa 231.0 | 92 U 238.0 | 93 Np - | 94 Pu - | 95 Am - | 96 Cm - | 97 Bk - | 98 Cf - | 99 Es - | 100 Fm - | 101 Md - | 102 No - | 103 Lr - | 104 Rf - | 105 Db - | 106 Sg - |

