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

1. Uran tabiiy radioaktiv parchalanish qatori uran-238 iztopi bilan boshlanib, qo'rg'oshin-206 izotopi bilan yakunlanadi. Uran-238 izotopi qo'rg'oshin-206 izotopigacha parchalanganida nechtadan α va β zarrachalar hosil bo'ladi?

A) 6α + 4β B) 6α + 6β C) 8α + 6β D) 8α + 8β

2. Qaysi qatorda C atomining qo'zg'algan holatdagi elektron konfiguratsiyasi keltirilgan?

A) $1s^2 2s^2 2p^2$ B) $1s^2 2s^1 2p^3$ C) $1s^1 2s^1 2p^3$ D) $1s^2 2s^2 2p^3$

3. Azotning maksimal valentligi va oksidlanish darajasi qanday?

A) IV, +4 B) IV, +5 C) V, +4 D) V, +5

4. Uranni to'yintirish maqsadida $^{235}UF_6$ va $^{238}UF_6$ qaysi yo'l bilan bir-biridan ajratiladi?

A) diffuziya B) xromatografiya C) haydash D) qayta kristallash

5. CO va H_2 aralashmasining geliyga nisbatan zichligi 2,125 bo'lsa, undagi CO ning hajmiy ulushini (%) hisoblang.

A) 25% B) 33% C) 67% D) 75%

6. 20 g kalsiy karbonati $CaO + CO_2 = CaCO_3$ reaksiya bo'yicha hosil bo'lganida 32 kJ issiqlik ajraladi. 1 mol kalsiy karbonati parchalanishi reaksiyasining issiqlik effektini hisoblang.

A) +32 kJ/mol B) -32 kJ/mol C) +160 kJ/mol D) -160 kJ/mol

7. $NO + ½O_2 \leftrightarrow NO_2$ reaksiyada kislorodning bosimi 4 marta oshirilsa, reaksiyaning muvozanat konstantasi (K_p) qanday o'zgaradi?

A) ortadi B) kamayadi C) o'zgarmaydi D) avval ortadi, keyin kamayadi

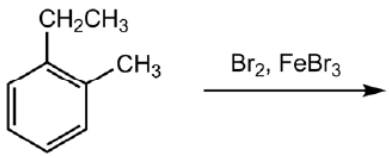
8. Sanoatda $K_2Cr_2O_7$ eritmasini 200,0 A tok kuchi bilan elektroliz qilib, 1,00 kg xrom olish uchun qancha vaqt (soat) talab etiladi?

A) 2,58 B) 7,74 C) 15,5 D) 31,0

9. Qaysi sinf uglevodorodlar tarkibidagi vodorodning massa ulushi ularning molekulasi tarkibidagi uglerod atomlari soniga bog'liq bo'lmaydi?

A) alkanlar B) alkenlar C) alkadienlar D) alkinlar

10. O'ng tomonda keltirilgan reaksiyada ko'pi bilan necha xil monobromhosila olish mumkin?



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

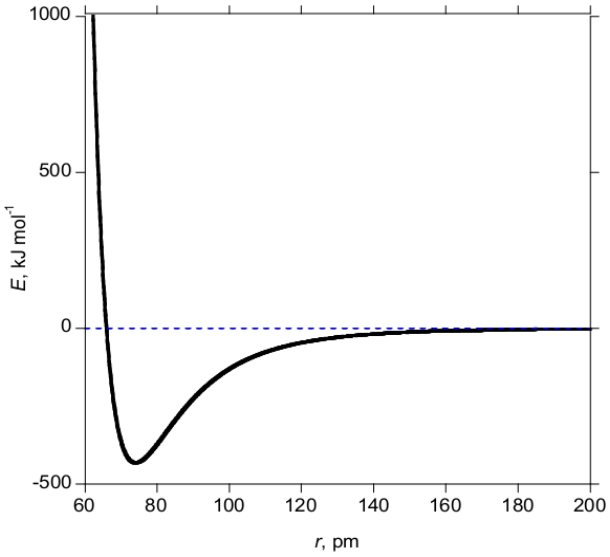
2-qism. Har bir topshiriq 1,5 balldan baholanadi

11. 1 kg boyitilgan uran yoqilg'isidan (massa bo'yicha 5% uran-235 saqlaydi) issiqlik reaktorlarida qancha vaqt 1 kW quvvatdagi elektr energiyasini ishlab chiqarish mumkin? (1 eV = $1{,}6 \cdot 10^{-19}$ J; 1 W = 1 J/sekund)

$^{235}U + n = {}^{141}Ba + {}^{92}Kr + 3n + 200$ MeV/(har bir uran-235 yadrosiga)

A) 3 soat B) 5 yil C) 130 yil D) 315 yil

12. O'ng tomondagi rasmda H_2 molekulasidagi potensial energiyaning (E) H-atomlari orasidagi masofaga (r) bog'liqligi keltirilgan. Erkin H-atomlarining potensial enegiyasi 0 kJ/mol ekanligi grafikdan ko'rinib turibdi.
H_2 molekulasida H-atomlari orasidagi masofa (pm) qanday?



A) 75

B) 100

C) 150

D) 200

13. Quyidagi moddalardan qaysi biri eng baland qaynash temperaturasiga ega?

A) $CH_3CH_2CH_2CH_3$ B) $CH_3CH_2OCH_3$ C) CH_3CH_2CHO D) $CH_3CH_2CH_2OH$

14. 100 ml 3% vodorod peroksid eritmasi (ρ = 1,01 g/ml) to'liq parchalanganida qancha hajm (20°C va 720 mm Hg bosimda) kislorod hosil bo'ladi?

A) 998 ml B) 1089 ml C) 1120 ml D) 1131 ml

15. Propanol-2 ning fermentativ degidrogenlanish reaksiyasi quyidagicha boradi: $CH_3CH(OH)CH_3 \rightarrow CH_3COCH_3 + H_2$. Moddalarning yonish entalpiyalaridan foydalanib reaksiyaning entalpiya o'zgarishini hisoblang: $\Delta H°_{yonish}$ ($CH_3CH(OH)CH_3$) = -1986 kJ/mol; $\Delta H°_{yonish}$ (CH_3COCH_3) = -1786 kJ/mol; $\Delta H°_{yonish}$ (H_2) = -286 kJ/mol.

A) -86 kJ/mol B) +86 kJ/mol C) -4058 kJ/mol D) +4058 kJ/mol

16. 700 K da siklopropan 1 bosqichda propenga izomerlanadi. 1 minut ichida siklopropanning bosimi 22 mm Hg dan 4,5 mm Hg gacha tushgan bo'lsa, reaksiyaning tezlik konstantasini (sekund^{-1}) aniqlang. 1-tartibli reaksiya uchun: $\ln p_t = \ln p_o - kt$.

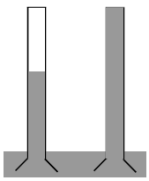
A) $3{,}8 \cdot 10^{-3}$ B) $2{,}6 \cdot 10^{-2}$ C) 0,23 D) 1,6

17. X_2 va Y_2 moddalar 2:1 nisbatda yopiq idishda aralashtirildi. $X_2 + Y_2 \leftrightarrow 2XY$ muvozanat qaror topganida geteroyadroli molekulalar (murakkab modda) soni gomoyadroli molekulalar (oddiy modda) soniga teng bo'lsa, muvozanat konstantasini hisoblang.

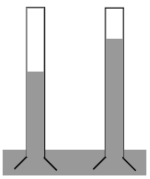
A) 1,2 B) 5,0 C) 7,2 D) 9,8

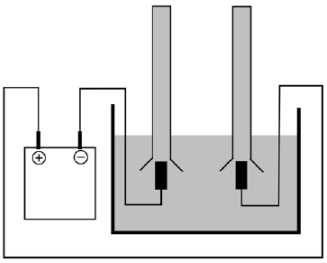
18. Sulfat kislota eritmasini elektroliz qilish uchun quyidagi yacheyka tayyorlandi:

A)

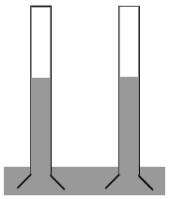


B)

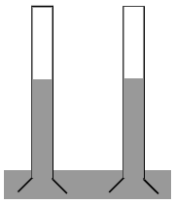




C)



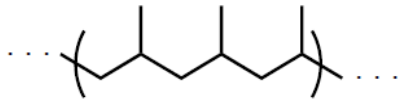
D)



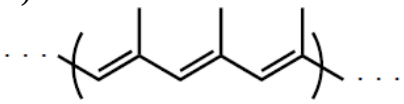
Elektrodlarda hosil bo'lgan gazlar sulfat kislota eritmasi bilan to'ldirilgan probirkalarga to'planadi. Elektroliz yakunlangach probirkalarda to'plangan gazlar miqdori qanday nisbatda bo'ladi?

19. Propilenning polimerlanishidan polipropilen hosil bo'ladi. Qaysi qatorda polipropilenning strukturasi to'g'ri ko'rsatilgan?

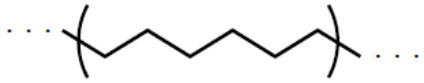
A)



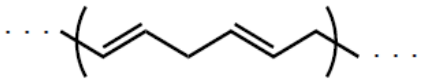
B)



C)



D)



20. Noma'lum uglevodorod ozonoliz qilinganida 2:1 nisbatda CH_2O va $OHC-CH_2-CHO$ hosil bo'lgan bo'lsa, noma'lum uglevodorodni aniqlang.

A) $CH_2=CH-CH_2-CH_3$ B) $CH_2=CH-CH_2-CH_2-CH_3$

C) $CH_2=CH-CH_2-CH=CH_2$ D) $CH_2=CH-CH=CH-CH_3$

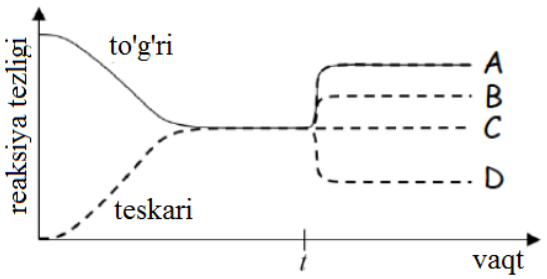
3-qism. Har bir topshiriq 2,6 balldan baholanadi

21. 12,8 g metall **X** konsentrlangan nitrat kislota eritmasida eritilganida 8,96 litr (n.sh.) qo'ng'ir gaz hosil bo'ldi. **X** metallni aniqlang.

22. Fosfor sulfidlaridan birida fosforning massa ulushi 56,36%. Ushbu modda bug'larining havo bo'yicha zichligi 7,58 ga teng. Sulfidning molekulyar formulasini aniqlang.

23. 0,0°C dagi 50,0 g muz 32,0°C li 350,0 g suvga solindi. Muvozanat qaror topganidan keyin suvning temperaturasi (°C) qanday bo'ladi? (Muzning erish issiqligi 334 J/g; suvning issiqlik sig'imi 4,18 J/K·g)

24. O'ng tomondagi rasmda gipotetik qaytar reaksiya tezliklarining vaqt o'tishi bilan qanday o'zgarishi keltirilgan.



t vaqtda muvozanatda turgan sistemaga katalizator qo'shilgan va to'g'ri reaksiya tezligi A egri chiziq bo'ylab ortgan.

Xuddi shu vaqtda teskari reaksiya tezligining o'zgarishi qaysi egri chiziqda tasvirlangan (A,

B, C yoki D)?

25. 11,65 g noma'lum qizil pigment kislorodda yoqilganida 0,739 ml og'ir suyuqlik (ρ = 13,6 g/ml) va 1,12 litr (n.sh.) gaz hosil bo'ldi. Noma'lum qizil pigmentning kimyoviy formulasini aniqlang.

26. Dorixonalarda H_2O_2 ning 3% li (massa bo'yicha) eritmasi dezinfeksiyalovchi vosita sifatida sotiladi. Shunday H_2O_2 ning eritmasidan X grammini kislotali sharoitda titrlash uchun 0,02 M li $KMnO_4$ eritmasidan foydalanildi. Bunda $KMnO_4$ eritmasidan 15,0 ml sarflandi. Titrlangan H_2O_2 eritmasining massasini (g) hisoblang.

27. 0,495 M HNO_2 eritmasining pH qiymayti 1,83 ga teng bo'lsa, HNO_2 ning kislotalik konstantasini (K_a) hisoblang.

28. **A** birikma faqat C, O va Cl atomlaridan tashkil topgan bo'lib, uning 3,00 g gaz holatidagi na'munasi 1,00 litr hajmli idishda 70,0°C da 0,854 atm bosim hosil qildi. **A** birikmaning 0,300 g boshqa na'munasi 100 ml suvda eritildi, natijada **A** dagi barcha Cl atomlari HCl ko'rinishiga o'tdi. Hosil bo'lgan HCl ni titrlash uchun 0,200 M NaOH eritmasidan 30,33 ml sarflandi. **A** birikmaning kimyoviy formulasini aniqlang.

29. CH_2=CH-CH=CH_2 va H_3COOC-CΞC-$COOCH_3$ qizdirilganida ular o'rtasida Dils-Alder reaksiyasi amalga oshadi va 6 a'zoli halqa saqlovchi **W** modda hosil bo'ladi. **W** moddaning strukturasini chizing.

30. $C_4H_{10}O$ tarkibli organik birikma ishqoriy metallar bilan ta'sirlashib H_2 gazini hosil qiladi. Biroq $KMnO_4$, $K_2Cr_2O_7$ kabi moddalarning kislotali eritmalari bilan oksidlanmaydi. Keltirilgan ma'lumotlarga tayanib, $C_4H_{10}O$ tarkibli organik birikmaning aniq strukturasini chizing.