

Olimpiada topshiriqlari

Kimyo 10

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

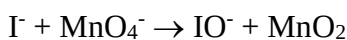
1. Qaysi elementning 1,00 gr na`munasi eng ko`p molekulani o`zida saqlaydi?

- A) Bakminsterfulleren, C_{60} B) Ozon, O_3
C) Oq fosfor, P_4 D) Oltingugurt, S_8

2. 0,1 M li 1 ml ikki valentli metal saqlagan eritmaning rangi och pushti bo`lib, unga 1 ml konsentirlangan HCl kislotasi eritmasi qo`shilsa, eritma rangi yorqin-ko`k rangga o`zgaradi. Metall ionini aniqlang.

- A) Ca^{2+} B) Mn^{2+}
C) Co^{2+} D) Cu^{2+}

3. Iodid ion asosli sharoitda permanganat bilan gipoyodit ionigacha quyidagi reaksiya bo`yicha oksidlanadi:



Tenglashtirilgan reaksiya tenglamasida gidroksid ionining iodid ioniga miqdoriy nisbati qanday?

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

4. $Na[V(CO)_6]$ kompleksida vanadiyning oksidlanish darajasi qanday?

- A) -1 B) +3
C) +5 D) +6

5. Qaysi kvant sonlar kombinatsiyasini real atomga qo`llash mumkin? Kvant sonlarning kelish ketma – ketligi – [bosh kvant son (n), orbital kvant son (l), magnit kvant son (m_l), spin kvant son (m_s)].

- A) [1, 0, +1/2, +1/2] B) [3, 0, 0, -1/2]
C) [2, 2, 1, +1/2] D) [3, 2, 1, 1]

6. I_3^- da markaziy atom I gibridlanishini aniqlang.

- A) sp^2 B) sp^3
C) dsp^3 D) d^2sp

7. Pastda keltirilgan atomlarni atom radiusi kamayib borishi taribida joylashtiring.

Pb, P, Cl, F, Si

- A) $Cl > F > Pb > Si > P$ B) $Pb > Si > P > F > Cl$
C) $Pb > Si > P > Cl > F$ D) $Pb > Cl > P > Si > F$

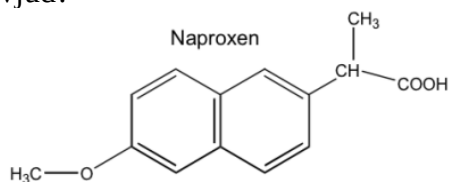
8. Quyidagi ikki atomli molekulalardan qaysi biri eng yuqori bog` energiyasiga ega.

- A) CO B) N_2
C) O_2 D) H_2

9. Kumush saqlovchi 1,50 gr ruda eritildi va barcha Ag^+ 0,124 gr Ag_2S ga aylandi. Rudadagi kumushning massa ulushini aniqlang.

- A) 6,41% B) 7,20%
C) 8,27% D) 10,8%

10. Naproksenda qancha uglerod atomi sp^- , sp^2 - va sp^3 - gibridlanishda hamda molekulada qancha π -bog` mavjud?



- 1) haroratni ko'tarish; 2) bosimni oshirish; 3) haroratni pasaytirish; 4) CO₂ konsentratsiyasini kamaytirish;

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A) 2, 3
C) 2, 4

B) 1, 4
D) 1, 3

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

21. Tartib raqami 19 bo'lgan element atomlarida nechta elektron pog'ona bor?

22. ^{32}S izotopi va ^{16}O , ^{17}O va ^{18}O izotoplaridan foydalanib necha xil oltingugurt (IV) oksidi molekularini olish mumkin?

23. Agar reaksiya unumi 70% bo'lsa, 2.45 g bertolle tuzidan necha l (n.sh.da) kislorod olish mumkin?

24. Tabiiy mis 63 va 65 izotoplardan iborat bo'lib, uning atom massasi 63.54 ga teng. Har bir izotopning tabiatdagi molyar ulushini mos ravishda aniqlang.

25. Qaysi agregat holatda har qanday modda elektr tokini o'tkazadi?

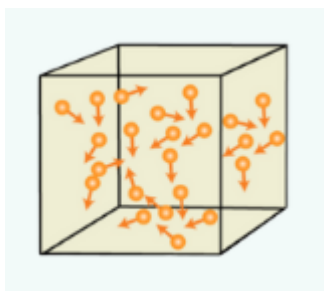
26. O'zgarmas harorat va hajmli germetik konteyner ichiga 3:1 mol nisbatda mos ravishda vodorod va azot joylandi, tegishli katalizator ishtirokida ammiak gazi hosil bo'ldi. Muvozanat qaror topganidan so'ng vodorod parsial bosimi kvadratining ammiak parsial bosimiga nisbati 0.2 ga teng bo'lsa, $\text{N}_2(\text{g}) + 3\text{H}_2(\text{g}) \rightarrow 2\text{NH}_3(\text{g})$ reaksiyasining muvozanat konstantasi K_p ni hisoblang.

27. Gazifikatsiya jarayonida ko'mir — uglerod monooksid va vodorod aralashmasiga aylanadi, aralashma suv gazi deb ataladi: $\text{H}_2\text{O}(\text{g}) + \text{C}(\text{q}) \rightarrow \text{CO}(\text{g}) + \text{H}_2(\text{g})$

Quyida berilgan reaksiya tenglamalari va entalpiya o'zgarishlaridan foydalanib, yuqoridagi reaksiyaning entalpiya o'zgarishini hisoblang.



28.

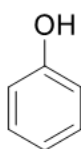


Chap tomondagi rasmda idish ichida dumaloq shakldagi molekulalar tasvirlangan. Ko'satkichlar molekulalarning harakat yo'nalishi va tezligini ifodalaydi.

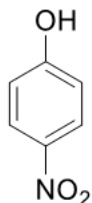
Rasmni tahlil qilib, unda moddaning qaysi agregat holati ifodalanganini yozing.

29. 500 ml suvda 0,050 mol HSCN eritilishidan eritma tayyorlandi. Eritmada vodorod ionlari konsentratsiyasi $8.88 \cdot 10^{-6} \text{ mol/l}$ ekanligi aqinlandi. HSCN uchun kislotalik konstantasini (K_a) aniqlang.

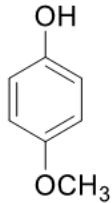
30. Pastda keltirilgan moddalarni kislotalik kuchi kamayishi tartibida joylashtiring.



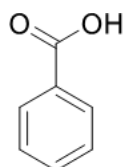
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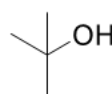
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5



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