

**O'ZBEKSTAN RESPUBLIKASI JOQARI HA'M ORTA
ARNAWLI BILIMLENDIRIW MINISTRLIGI**

Berdaq atindag'i Qaraqalpaq ma'mleketlik universiteti

XIMIYA-TEXNOLOGIYA FAKULTETI

**“ORGANIKALIQ HA'M ORGANIKALIQ EMES XIMIYA
kafedrasi**

REFERAT

Tema:Vodorodtin aliniwi

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Vodorod tabiyatta tarqaluwi

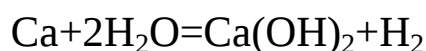
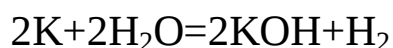
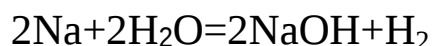
1776-jili inglis alimi Kavendish 1873-jili Lavuaze vodorodtin qasiyetlerin aniqladi. Vodorodti XVI asrde Paratsels ashqan edi. Onin ximiyaliq belgisi H_2 , yadro zaryadi +1 ge ,elektron konfiguratsiyasi $1s^1$ ten. Vodorod oz birikpelerinde bir elektron berip +1 oksidleniw darejesin yaki bir elektrondi basip alip -1 oksidleniw darejesin korsetedi. Sonliqtan vodorod I ham II gruppalarda jaylasqan. Demek siltilik metallar siyaqli metal emesler menen birigip +1 okisleniw darejesin ham galogenler siyaqli metallar menen birigip -1 okisleniw darejesin korsetedi.

Vodorod tabiyatta erkin halda ham birikpe halinda ushraydi. Erkin halda az ushraydi ham jenil gaz bolgani ushin hawanin joqari qatlamlarinda boladi. Vodorod suw turli minerallar, neft, tabiiy gaz, haywan ham osimlik organizmindegi zatlar quraminda ushraydi. Vodorodtin ush izotopi bar 1H -protiy, 2H -deyteriy, 3H -tritiiy. Vodarod izotoplari protiy- bir proton ham bir elektronnan ,deyteriy - bir proton, bir neytron ham bir electron ,tretiy – bir proton, eki neytron ham bir electron payda etedi. Vodorod jer qabiginin 0.15 % quraydi. Jerdegi mol mugdari 3% quraydi. Vodorod O_3 ham basqada oksidleniwshiler menen oksidlenip atmosferada tez joq bolip ketedi. Sonliqtan vodorod gidrofil ham metofil lement bolip tabiladi. Quyash quraminda 84% vodorod bar. Vodorod kosmosta (juldizlar ulken planetalar yupiter, Saturn h.t.b.) ken tarqalgan element. Kosmosta 63% vodorod , 36% geliy, 1% basqa elemenler bar.

Vodorodtin aliniwi :

Vodorod bir neshsh e usillar menen alinadi.1.Suwga metallar tasir ettiriw arqali:

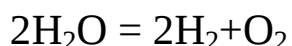
Na,K,Ca metallari apiwayi temperaturada suwdan vodorodti sigip shigarip,silti payda etedi.



Basqa metallarda suwdan vodorodti sigip shigariwi mumkin, biraq bunda reakstiya joqari temperaturada baradi. Misali: suwga temir tasir ettirip, vodorod ajratip aliw ushin suw puwi 800° qa shekem qizdirilgan temir ustinen otkiziledi.

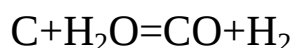


2.Elektro ximiyaliq usil:Suw elektr togi tasirinde vodorod ham kislorodqa ajraladi.



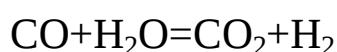
Taza suw elektr togin otkizbeydi, sonin ushin suwga NaOH, KOH, yaki H₂SO₄ ten biraz qosiladi.

3.Konversiya usili: Eger komir shogi ustinen suw puwi otkizilse H₂ ham CO aralaspasi payda boladi.

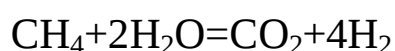


Bul aralaspa suw gazi dep ataladi. Saatina 4000-10 000 m³ suw gazi islep shigaratigin apparatlar bar. Sanaatda suw gazinin ahmiyeti ulken. Odan kop gana zatlar sintez qilinadi, sonin ushi suw gazi, kobinshe sintez gazi dep te ataladi. H₂ ham CO dan tazalaw ushin sintez gazine suw puwi aralastiriladi ham aralaspa qizdirilgan temir (III) oksidi ustinen otkiziledi.

CO suwdin kislorodin biriktirip alip CO₂ payda boladi. Fe (III) oksidi bul reaksiyada katalizator waziypasin atqaradi.



Bul eki reaksiyada payda bolgan vodorodqa CO₂ aralasqan boladi. Vodorodti CO₂ den tazalaw qiyin emes. H₂ penen CO₂ aralaspasi 20 atm basim astinda suw arqali otkizilse CO₂ suwda qaladi. Konversiya usili vodorod ajratip aliwda en kop qollanilatugin usil esaplanadi. CO siyaqli metan CH₄ di da konversiya qiliw mumkin.

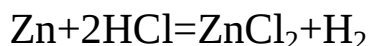


Bul reaksiyada da joqaridagi reaksiyalar siyaqli joqari temperaturada katalizatorlar qatnasinda baradi. Katalizatorlar Ni ham Co ga alyuminiy, magniy, germaniy, stirkoniy oksidleri qosip tayarlanadi. Shirshiq elektroximiya kombinatida ammiak sintez qiliw ushin kerek bolatugin vodorod usi waqitlarga shekem suwdi elektr togi arqali tarqatiw ham komirdi konversiya qiliw usili menen alinatugin edi, endi Buxara gazinen alina basladi.

4. Koks gazinen vodorodti ajratip aliw: Tas komir hawasiz jayda qizdirilganda ajralip shigatugin gazlar aralaspasi - koks gazinin 50-60 procenti vodorod boladi. Koks gazi tomen

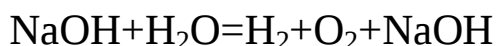
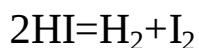
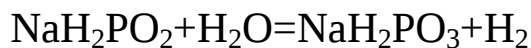
temperaturalarga shekem suwiltisa, barliq gazler suyiq halga otedi, vodorod bolsa gaz halinda qaladi.

5. Kislotalardan vodorod ajratip aliw : Suyiltirilgan HCl yaki H_2SO_4 ke tsink tasir ettirilse vodorod ajralip shigadi.

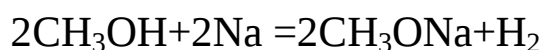
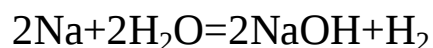
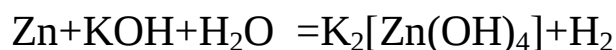
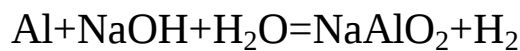
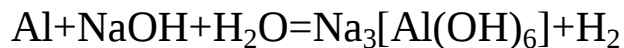
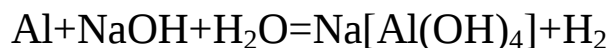
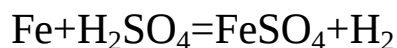
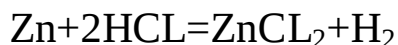


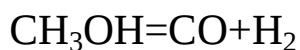
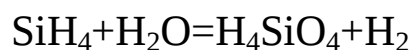
Labaratoriyada vodorod usi usil arqali alinadi, bunda reaksiya Kipp apparatinda alip bariladi.

Sanaatta aliniwi:



Labaratoriyada aliniwi:





Vodorodtin fizikaliq ham ximiyaliq qasiyeti

Vodorod rensiz, iyissiz, damsiz gaz. Ol hawadan 14.5 ese jenil. Vodorodtin tigizligi $d=0.08\text{g/sm}^3$ Vodorodtin kislorod penen aralaspasi ($2\text{H}_2+\text{O}_2$) jarilgish gaz dep ataladi. Ol qoparilgish, sonliqtan qawiqli. Vodorod suwda az eriydi. (100 ml suwda 2 ml vodorod eriydi, biraq Ni, Pt, Pd siyaqli metallarda vodorod jaqsi eriydi. Vodorod eki allatropik tur ozgeriske iye. Ortovodorod ham paravodorod. Formulalari birdey H_2 bolip, olardin qasiyeti birdey, fizikaliq qasiyeti bir - birinen parqlanadi. Paravodorod adettegi temperaturada turaqli, paravodorod katalizator komir ham platina qatnasinda joqari temperaturada qizdirilsa ortovodorodqa aylanadi. Ortovodorod molekulasindagi eki yadro oz ogi atirapinda bir tarepke, paravodorod molekulasida bolsa teris tarepke aylanadi. Adettegi sharayatta vodorod aktiv bolmasa da, joqari temperaturada kop gana elementler menen birigedi. Ol fluor menen gana partlap birigedi, jaqtiliq tasirinde xlor menen birige aladi, isitilganda kislorod penen ham basqa kop gana elementler menen reaksiyaga kirisedi. Vodorod tomen basimda aste electron razriyadin tasir ettirgende atomar vodorod payda etedi. Ol shama menen bir neshe sekund gana erkin halinda bola aladi. Atomar vodorod ximiyaliq jaqtan juda aktiv. Atomar vodorodtin janiw temperaturasi 4000° jetedi. Bunday janiw qiyin suyiqlaniwshi metallari qirqiwda ham metallari (payvandlawda) qollanadi. Bul maqsette atomar gorelkalarinan paydalanadi. Atomar gorelkada eki wolfram elektrod arasinda elektr nayi payda

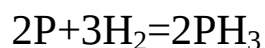
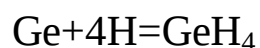
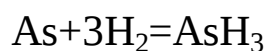
boladi ham gorenkaga vodorod jiberiledi. Elektr nayinda vodorod molekulalari atomlarga dissotsiyanadi. Payda bolgan atomar vodorod naydan arman otken son jane birigip, molekula payda boladi. Bul protses waqtinda shiqqan energiya jalinnin temperaturasi 4000° jetkizedi. Atomar vodorod bir taq elektron bolgani ushin kop gana basqa elementler menen kovalent baylanis payda etip ansat birigedi.

Atomar vodorod kop gana metallarda ansatliq penen eriydi, bunin' natijesinde (qatishmalar) inter metal birikpeler ham qatti elementler payda boladi.

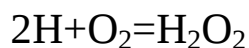
Atomar vodorodlar bir – biri menen kovalent baylanis arqali molekulyar vodorod payda etedi. Molekulyar vodorod juda bekkem, jenil ham hareketshen, kishi molekula. Sol sebepli vodorod tomen temperaturada suyiqlanadi ham qaynaydi.

Molekulyar vodorod suwda ham organik eritkishlerde kem eriydi, joqari temperaturada atomlarga tarqaladi. Qatti halinda vodorod geksanol kristal reshetkaga iye. Vodorod molekulasida oksidlewshi ham qaytariwshi qasiyetti korsetedi.

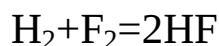
Vodorod qadimgi jagdayda N_2 , S, P, As reaksiyalasadi.



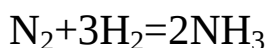
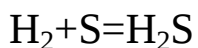
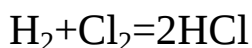
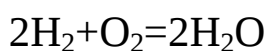
Komnata temperaturasinda molekulyar vodorod penen reaksiyaga kirispeydi, al atomar vodorod ham kislorod penen reaksiyalasip vodorod peroksidin payda etedi.



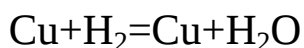
Vodorod qadimgi temperaturada ogada turaqli, komnata temperaturasinda F_2 menen qoparilis payda etip reaktsiyaga kirisedi.



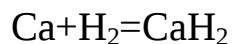
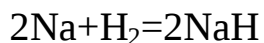
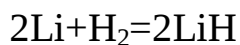
Vodorod kopshilik metallar ham metal emesler menen qizdirganda reaktsiyaga kirisedi.



Vodorod metall oksidlerinen metallardi qalpine keltiredi.



Vodorod metallar menen payda etken birikpeleri gidridler dep ataladi.

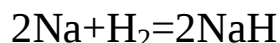


Vodorodtin atom awirligi 1.00797 ge, suyiqalaniw temperaturasi $t_c = -259^\circ$, qaynaw temperaturasi $t_{qay} = -253^\circ$. En jenil gaz. Vodorod molekulalari tez hareketlenedi, sonin ushin jaqsi diffuziyalanadi ham issiliqti jaqsi otkizedi.

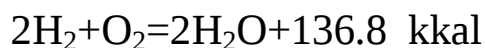
Vodorod metalloidlar menen kovalent baylanisip, polyar emes ham polyar birikpeler payda etedi.

Misali: H_2S , H_2O , NH_3 , CH_4 h. t. b

Vodorod metallar menen birigiwde vodorodtin atomi metallardan bir elektron alip teris ionga aylanadi.



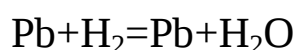
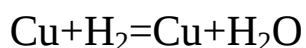
Vodorod kislorodda yaki hawada jandirilsa ,kislorodti biriktirip aladi ham suwdi payda etedi.



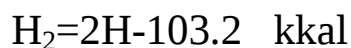
Vodorod janganda kop issiliq shiqqani ushin jalinnin temperaturasi 1000^0 jetedi. Vodorod janip atirganda ogan kislorod jiberilse jalinnin temperaturasi $2500 - 3000^0$ shekem koteriledi.

Bunday janiw H_2 ham O_2 janiw dep ataladi ham texnikada kop gana metallardi suyiqlandiriw ushin qollaniladi. Vodorod – kislorod janiw tiykargi gorelkalarinda payda boladi.

Bul gorelka biri ekinshisinin ishine kiritilgen, eki metalliq naydan ibarat. Ishki naydan kislorod ,sirtqi naydan bolsa vodorod jiberiledi. Aralaspa naylar ishinde jandiriladi ham joqari temperaturada vodorod ham kislorodli janiw usi tarizde payda boladi. Vodorod joqari temperaturada hatteki birikpelerdegi kislorodti biriktirip aladi.



Bul qasiyet vodorod qaytariw qasiyeti esaplanadi. Joqari temperaturada vodorod molekulası atomlarga ajraladi.



Bul reaksiya qaytar reaksiya esaplanadi. Zatlardin tarqaliw reaksiyasi qaytar bolsa, bunday protses dissotsiyalaniw dep ataladi. Issiliq tasirinde dissotsiyalaniw termik dissotsiyalaniw dep ataladi.

Vodorodtin dissotsiyalaniwi endotermik reaksiya, al bunin kerisi, yagniy vodorod atomlarinan vodorod molekulası payda bolsa ekzotermik reaksiya dep ataladi. 1700° vodorod 1% ten kem bolegi, 4700° shama menen 95% ti dissotsiyalanadi.

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