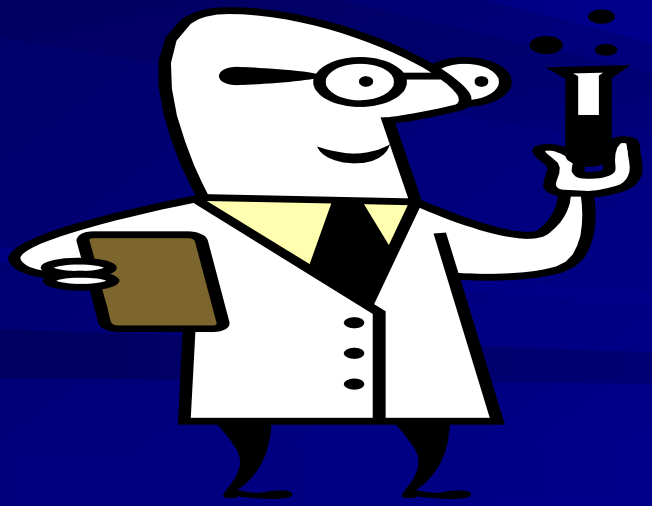
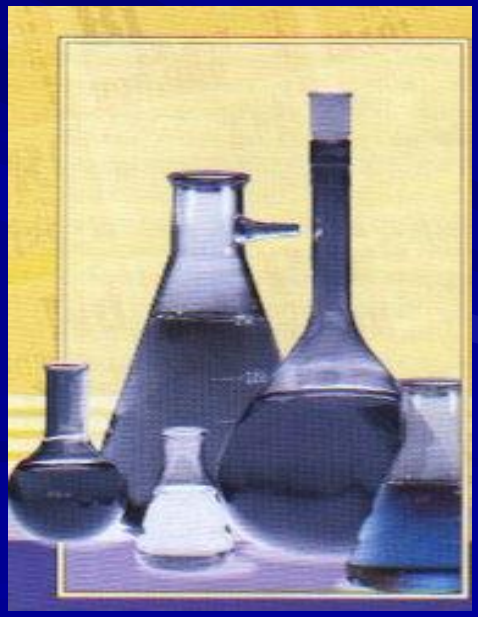
Vodorodni sanoatda olinishi va qo'llanilishi

Q. O'. Komilov

Mashg'ulotning maqsadi:

- *Vodorodni laboratoriyada va sanoatda olish usullarini o'rganish.*
- *Vodorodni qo'llanilishining asosiy yo'nalishlarini ko'rib chiqish.*





Vodorodni sanoatda olinishi

- Ma’lumki sanoat miqiyosida ko’p hajmda vodorodni sanoatda ishlab chiqarish uchun oson topiladigan arzon xomashyo kerak bo’ladi. Bunda modda bo’lib tabiiy gaz (metan- CH_4) va suv hisoblanadi. Tabiiy gazning zahiralari juda ko’p, suv esa amalda chegaralanmagan.

Vodorodni sanoatda olinishi

- 1. Asosan tabiiy gazdan konversiya usulida (aylantirish) suv bug'lari va katalizator ta'sirida olinadi:

$$CH_4 + 2H_2O \rightarrow 4H_2\uparrow + CO_2$$

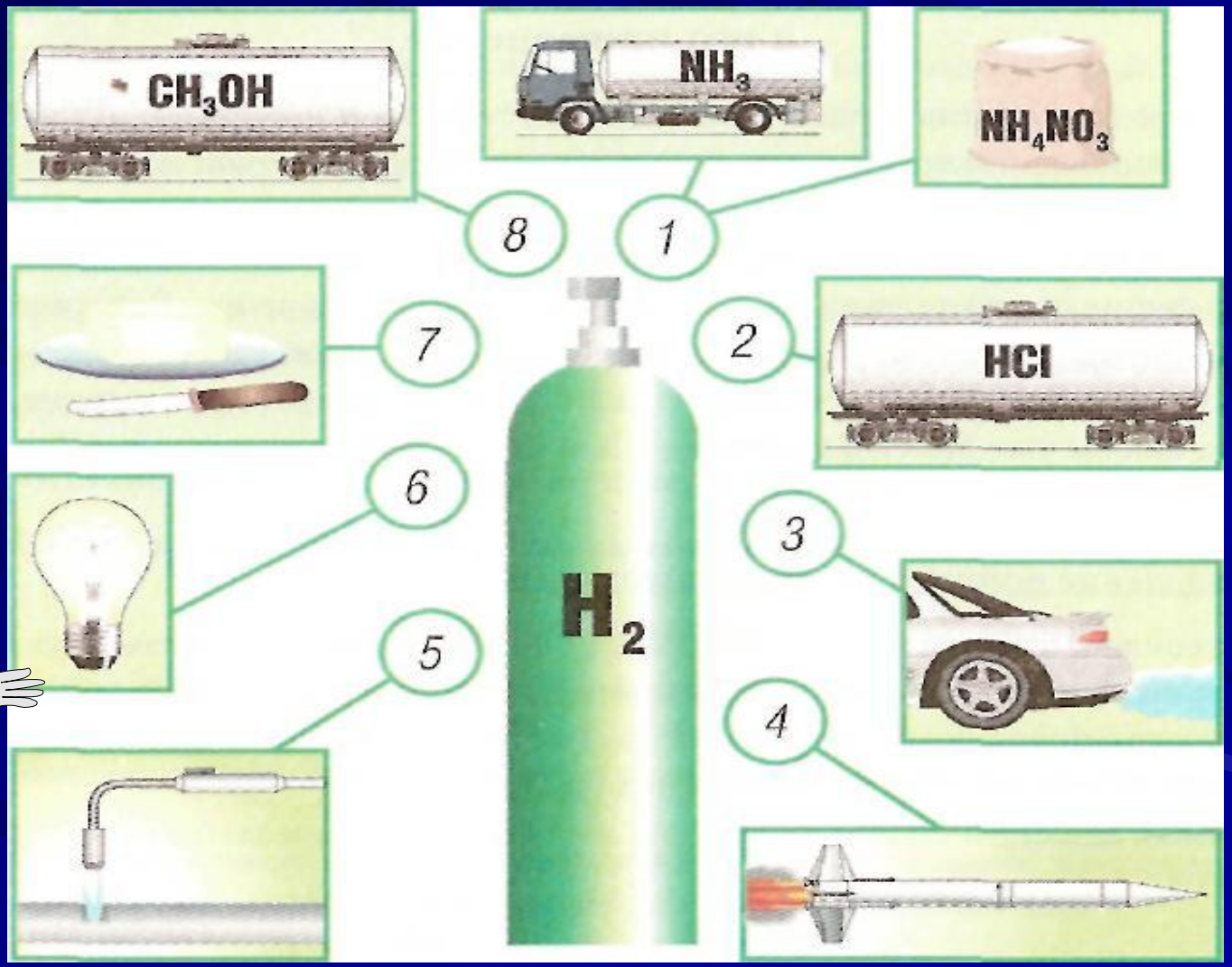
- 2. Qizdirish: $CH_4 \rightarrow 2H_2\uparrow + C$
- 3. Elektr toki ta'sirida suvni parchalab:

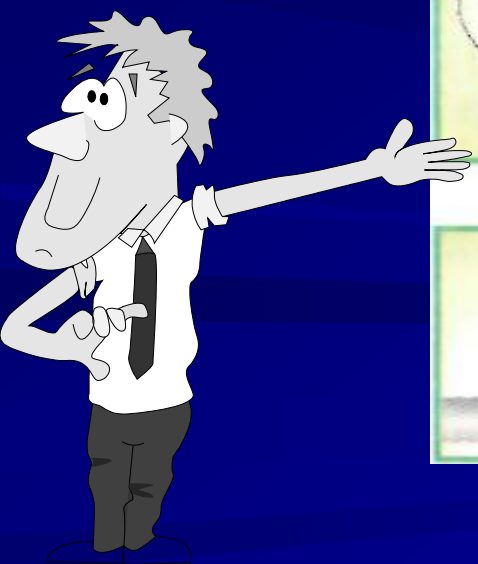
$$2H_2O \rightarrow H_2\uparrow + O_2\uparrow$$

- Sanoatda vodorodni cho'g'lantirilgan ko'mir ustidan suv bug'larini o'tkazish yo'li bilan ham olinadi:

$$C + H_20 = CO + H_2.$$

Vodorodni qo'llanilishi



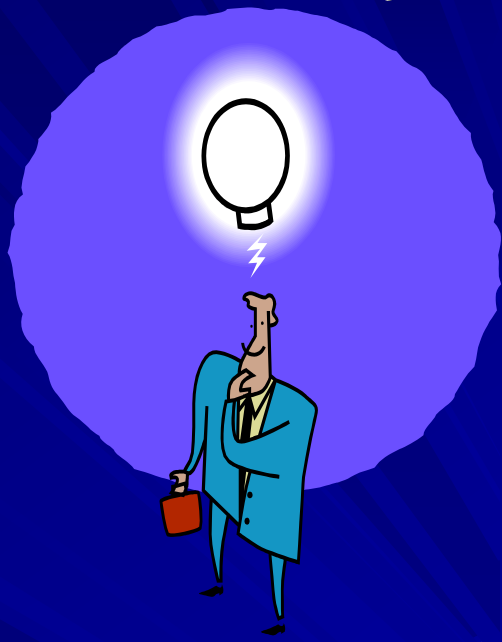


Vodorodni qo’llanilishi

- *1* — minyeral o’g’itlar ishlab chiqarishda
- *2* — xlorid kislota olishda;
- *3* — vodorod — XXI asr avtomobillari yoqilg’isi;
- *4* — raketa dvigatyellari uchun yoqilg’i;
- *5* — metallarni ulash va kesish;
- *6* — qiyin eruvchan metallar olishda;
- 7 — qattiq yog’lar olishda (margarin);
- *8* — metil spirti va boshqa organik moddalar sintezida.

Xulosalar:

- **Sanoatda vodorodni olish uchun mavjud va arzon xomashyo - tabiiy gaz, toshko’mir va suvdan foydalaniladi.**
- **Vodorod XXI asr energiyasining manbaasi hisoblanadi.**



Savollar:

- Sanoatda vodorodni olishning qanday usullari ishlatiladi?
- Nima uchun laboratoriyada vodorodni elektr toki yordamida suvni parchalab olinadi, sanoatda esa bu usul qo’llanilmaydi?
- Inson faoliyatining turli yo’nalishlarida vodorodni qo’llanilishi ga sabab bo’ladigan vodorodning xossalarini sanab o’ting.

Reaksiya tenglamalarini tugallang va ularning turini aniqlang:

1. H_2O_2 =
2. S + O_2=
3. Al + HCl=
4. HgO + H_2=
5. H_2 + Cl_2=
6. HgO=
7. Al + O_2=
8. Zn + H_2SO_4=
9. PbO +H_2 =
10. Na +H_2=

Javoblar:

- 1. $H_2O_2=2H_2O+O_2$
- 2. $S + O_2=SO_2$
- 3. $2Al+6HCl=2AlCl_3+3H_2$
- 4. $HgO +H_2=Hg+H_2O$
- 5. $H_2 + Cl_2 =2HCl$
- 6. $2HgO=Hg+O_2$
- 7. $4Al +3O_2=2Al_2O_3$
- 8. $Zn+H_2SO_4=ZnSO_4+H_2$
- 9. $PbO +H_2 =Pb+H_2O$
- 10. $2Na + H_2=2NaH$

Reaksiya turlari:

- 1 parchalanish reaksiysi;
- 2 birikish reaksiyasi;
- 3 o’rin olish reaksiyasi;
- 4 o’rin olish reaksiyasi;
- 5 birikish reaksiyasi;
- 6 parchalanish reaksiysi
- 7 birikish reaksiyasi;
- 8 o’rin olish reaksiyasi;
- 9 o’rin olish reaksiyasi;
- 10 birikish reaksiyasi;