Name -> SURAJ KUMAR YADAV
Class Roll No. -> PK 44
Exam Roll No. -> 2022OPHYO14

Date -> 25/2/22

ANCILLARY CHEMISTRY - II

1) Conventional Energy Sources. (Advantages)
-> They are abundant & affordable
For eg: oil & diesel
-> Efficiency & Production expenses of are low

Disadvantages:
-> It can't be replaced or revitalized.
-> It is not environment friendly

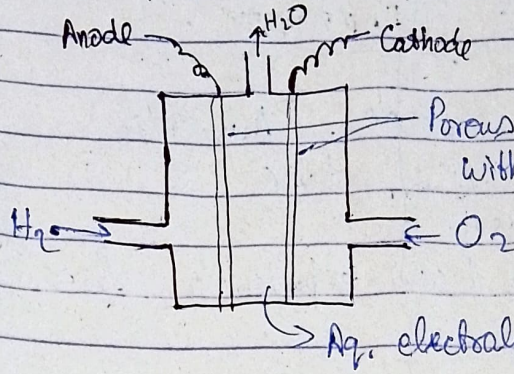
Non-Conventional Source of Energy

Advantages
-> Enviroment friendly
-> Inexhaustible
-> Easy to operate

Disadvantages
-> Inconsistent, Unreliable Supply
-> Pollution
-> Low Efficiency levels
-> High cost

-> In present scenario
Non-conventional energy have sufficient & infinite source while other conventional sources are finite & someday be empty. Due to development of renewable energy plant like solar, wind, etc create an employment opportunity & also reduce the power crises & up economic growth of country.

2) A simple H_2-O_2 fuel cell is shown in fig. below.



The cell consist of two porous carbon electrodes impregnated with a suitable catalyst such as Pt, Ag, CoO etc. The space b/w two electrode is filled with concentrated soln of KOH or NaOH serves as an electrolyte. H_2 & O_2 gas bubbled in the electrolyte through porous carbon electrode as shown in fig.

Follow. rxn takes place

At Anode: $H_2(g) + 2OH^-(aq.) \longrightarrow 2H_2O(l) + 2e^-$ X 2

At Cathode $O_2(g) + 2H_2O(l) + 4e^- \rightarrow 4OH^-(aq.)$

Net rxn $2H_2(g) + O_2(g) \longrightarrow 2H_2O(l)$

Thus, overall cell rxn involves the comb^n of $H_2(g)$ & $O_2(g)$ to form water.

3) On Fractional Distillation of Crude Oil, we get the follow. products

→ Fuel Gas, (PG: refinery gas (1 - 2%)
↳ no. of hydrocarbon → C 1 to 4
T < 25°C

→ Gasoline Petrol (15-25%)
↳ no. of hydrocarbon → C 5 to 7
↳ T ⇒ 25-75°C

→ Naphtha (20-40%)
↳ no. of hydrocarbon = C 6 to 10
↳ T → 75-190°C

→ Paraffin, Kerosene (10-15%)
↳ no. of hydrocarbon = C 10 to 16
↳ T → 190-250°C

→ Diesel oil, gas oil (15-20%)
↳ no. of hydrocarbon ⇒ C 14 to 20
↳ T → 250-350°C

→ Heavy fuel oil, heating oil, greases &.
↳ no. of hydrocarbon → C 20 to 30
↳ T → greater than 350°C

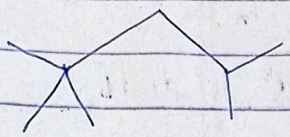
→ Residue - fuel oil, lubricating oils, waxes & bitumen (40-50%)
↳ no. of hydrocarbon → C > 30 to ~~100~~ several hundred
↳ T for Heavy fuel > 350°C
T for bitumen component ⇒ 500°C - 700°C

4) Octane No.
→ measure of performance of a fuel
→ given for gasoline
→ Imp. for predicting the knocking of an engine
→ octane rating is done considering the octane no. of isooctane as 100

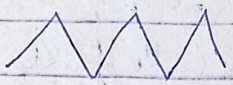
Centane No.

→ measure of dealy of ignition of a fuel
→ Imp. for predicting the ignition of an engine
→ given for diesel
→ Centane rating is done considering the ignition of centane

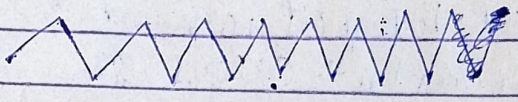
Highest Octane no. → Iso-octane



Lowest Octane no. → n-heptane



Highest Centane no → $C_{16}H_{34}$



Lowest 2-methyl naphthalene (centane no.)