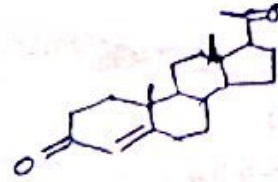


M.Sc. IV Sem. Natural Products H-4016 2nd lect - by P.K. Sharma.

② Gestagens

Imp.

PROGESTERONE



Hormone is mainly secreted by corpus luteum or yellow body of the ovary.

It occurs in human placenta, adrenal cortex, pregnancy urine. At the time of puberty (sexual maturity) a tissue is formed in the ovary, which is called corpus luteum or yellow body. Its main function is to prepare for and maintain pregnancy.

Oestradiol brings about growth of uterine mucosa, secretion of progesterone stimulates it in size, which is now ready to receive the fertilized ovum. If fertilization does not take place, the excess of uterine mucosa is carried away in the form of Menstrual Cycle. If fertilization occurs, then instead of undergoing degeneration, it has to perform following functions -

- ① Prevents ovum formation
- ② Maintains favourable condition in the uterus for development of embryo

- 3) Retards uterine mobility
- 4) Induces mammary gland development with oestrogen

(6) (9)

Constitution ① molecular formula $C_{21}H_{30}O_2$

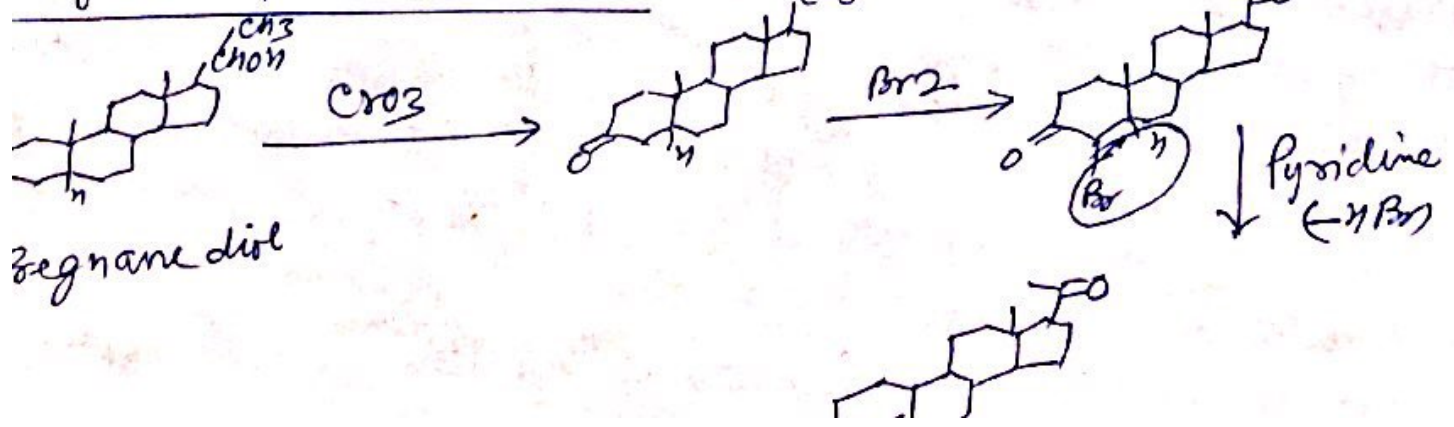
- ② It forms diosime, showing the presence of two ketonic groups
- ③ On catalytic reduction, it takes up three molecules of hydrogen, out of which two molecules of hydrogen might have been used for reduction of two ketonic groups, while third molecule of hydrogen would have been used for reduction of one double bond. Thus it shows presence of one double bond in progesterone

Tetra cyclic skeleton molecular formula of saturated hydrocarbon of progesterone comes out to be $C_{21}H_{36}O$, analogous to $C_{27}H_{48}$ showing tetra cyclic skeleton. X-ray studies suggest that it has steroid nucleus. Moreover, it can be prepared from cholesterol or stigmasterol, which again confirms steroid nucleus.

Hormone has been found to be very sensitive towards alkali, showing the presence of α, β unsaturated ketonic group (λ_{max} , 240 nm). Absorption spectrum confirms double bond at C-4.

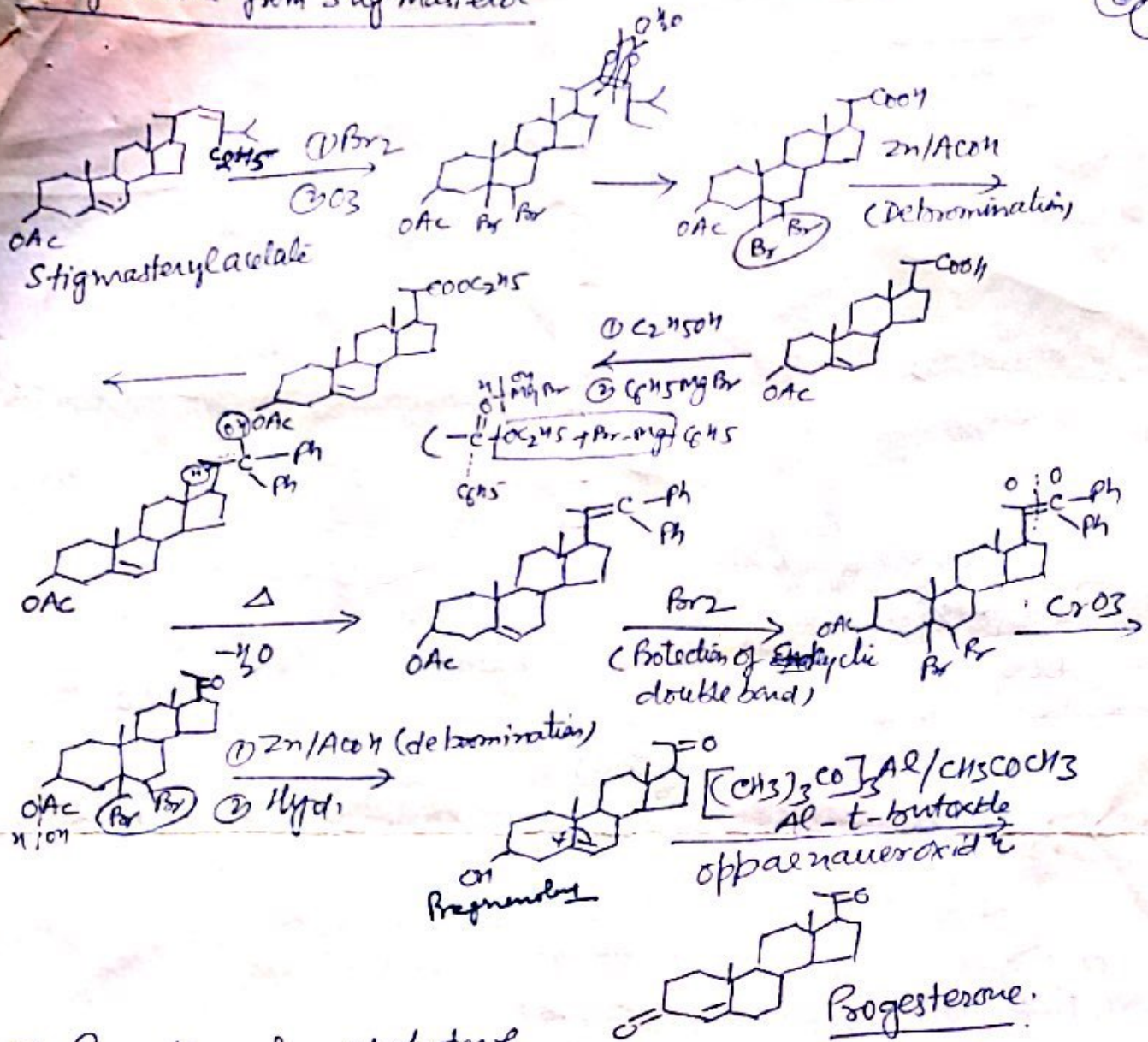
Presence of $-COCH_3$ group - It shows haloform reaction, confirming presence of $-COCH_3$ group. On this basis, we can assign following structure to progesterone, which is confirmed by various syntheses -

Progesterone from Pregnandiol

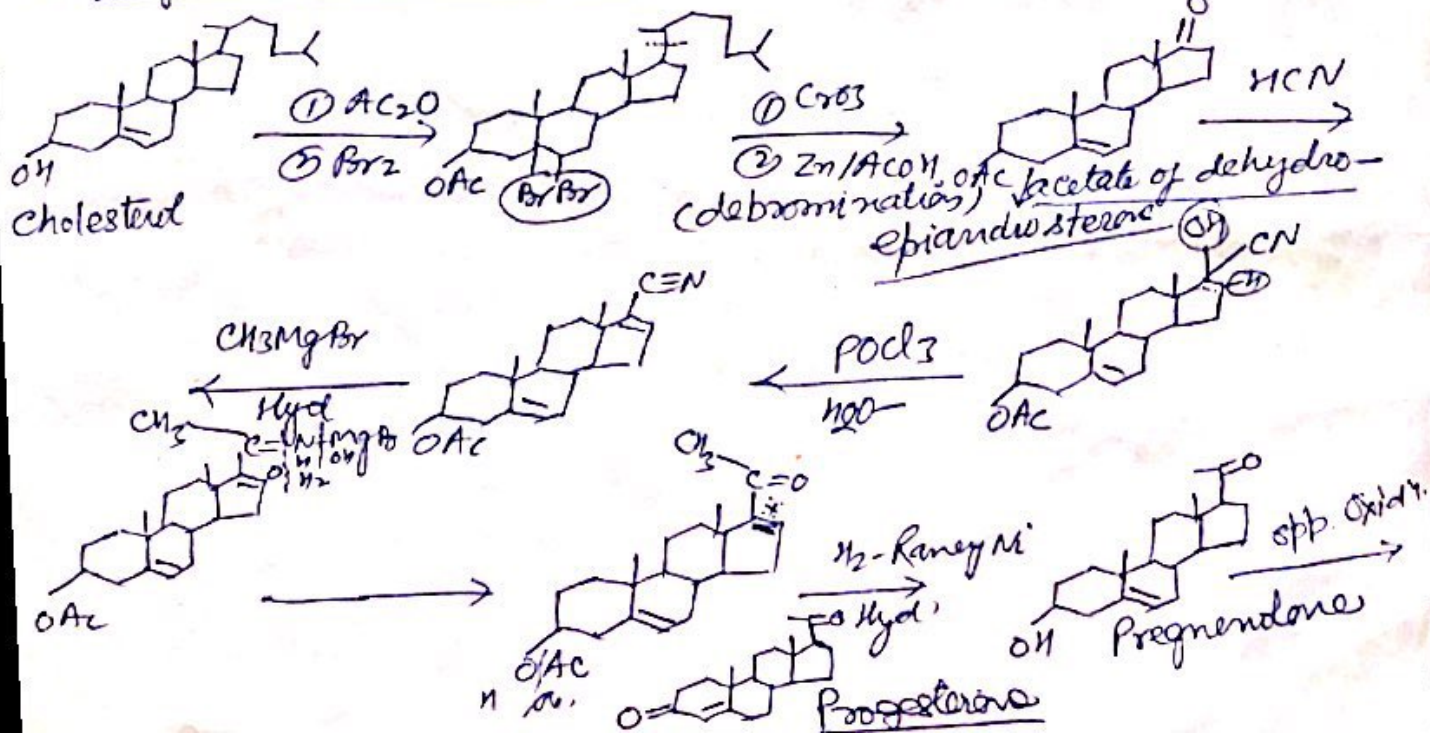


2) Progesterone from Stigmasteryl acetate

(7)



3) Progesterone from cholesterol



(4) From Ergosterol

