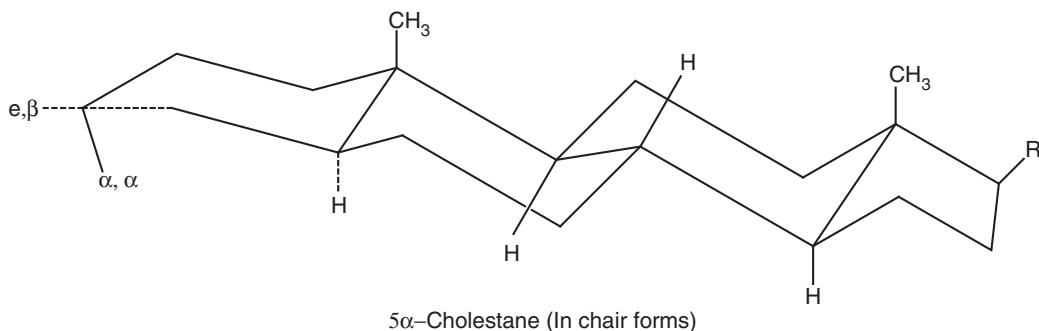
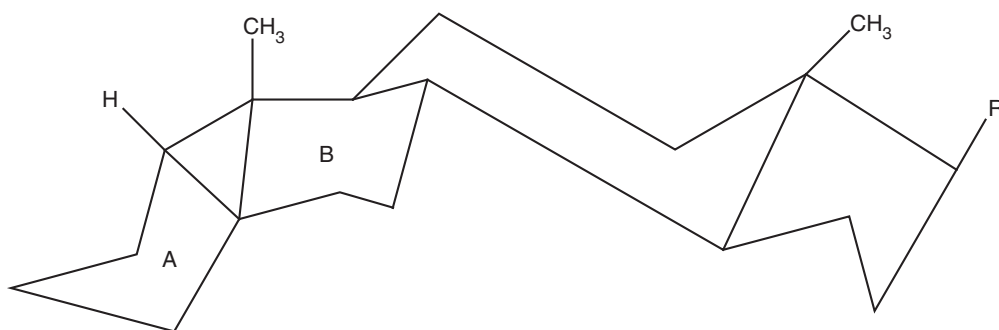


Conformations: There are six asymmetric carbon atoms in the nucleus 5, 8, 9, 10, 13, and 14. Therefore, there are $2^6 = 64$ optically active forms possible. Cholestane, androstane, and pregnane can exist in two conformations, that is, chair form and boat form.

Cholestane A,B-*trans* form



Coprostane A,B-*cis* form



Chair confirmation is more stable than boat confirmation due to less angle strain, and hence, all cyclohexane rings in the steroid nucleus exist in the chair confirmation.

Classification

The adrenal cortex synthesizes two classes of steroids. They are as follows:

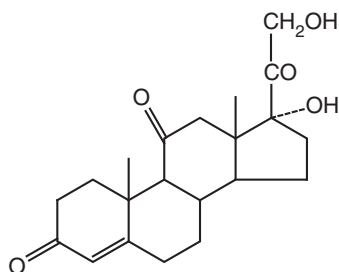
Glucocorticoids: These steroids regulate the carbohydrates, proteins, and the fat metabolism and are intimately involved in the operation of the processes that enable the body to resist infections and stress.

Example—hydrocortisone and cortisone.

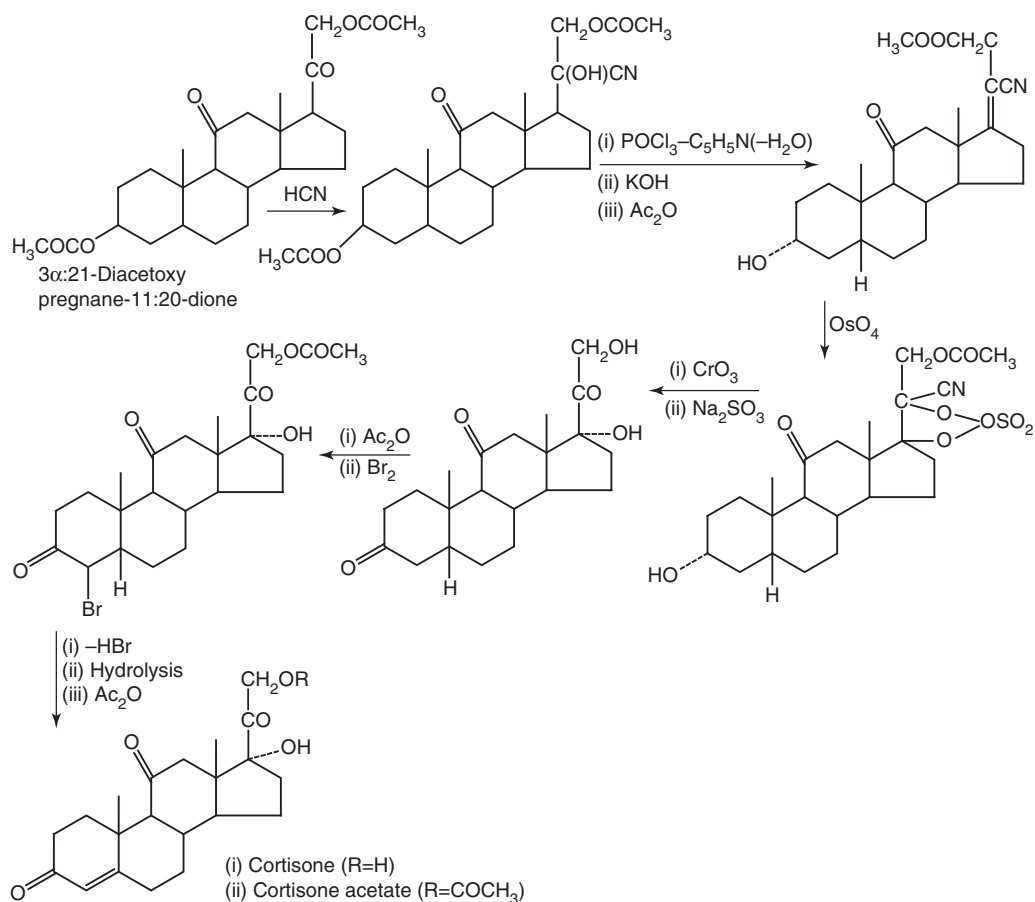
Mineralocorticoids: These steroids mainly influence salt and water balance (and hence, the control of blood volume and blood pressure) by maintaining proper electrolyte balance.

Example—aldosterone, 11-deoxycorticosterone.

i. Cortisone (Cortogen, Cortone)



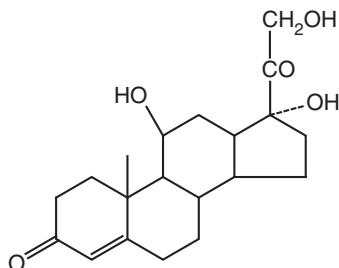
Synthesis



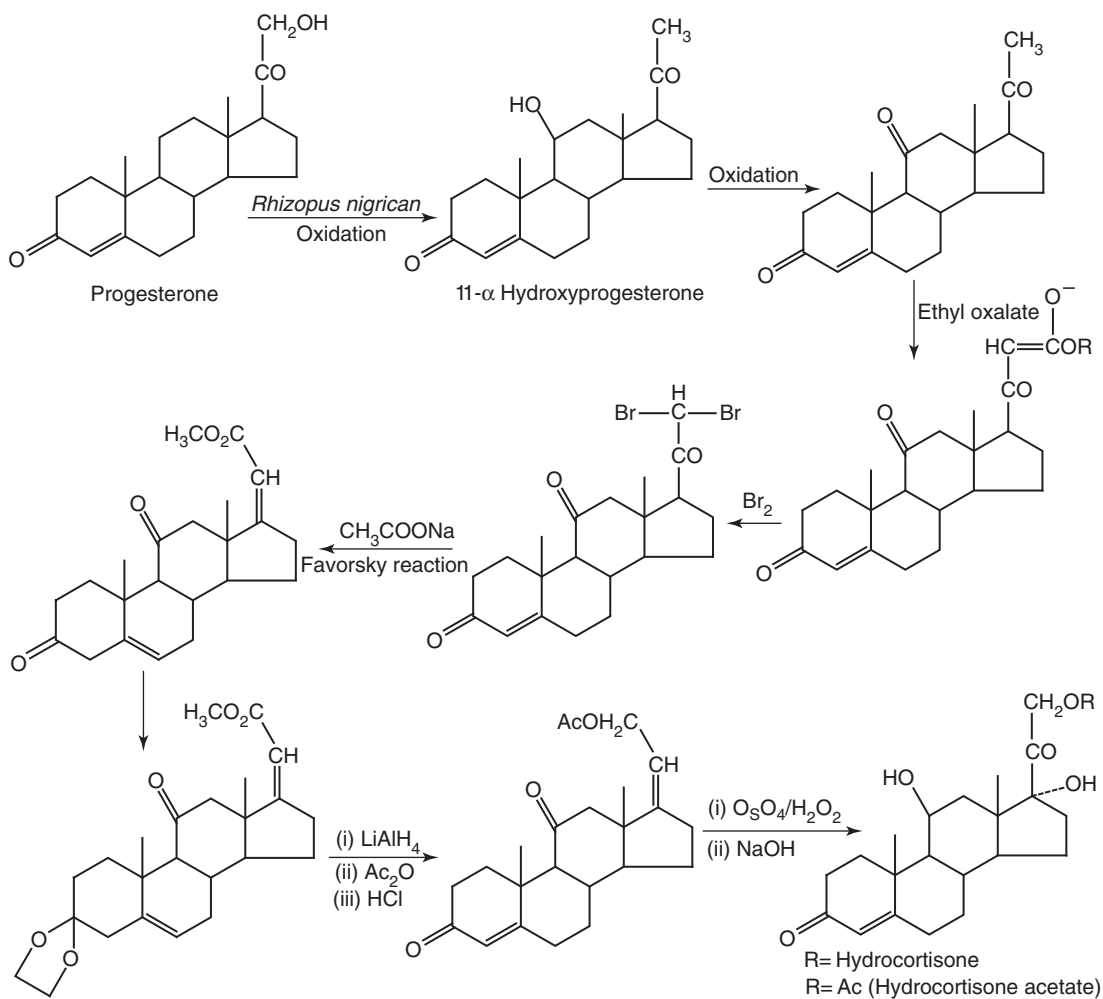
Properties and uses: It is a white, crystalline powder, insoluble in water, and soluble in alcohol. It is used in rheumatoid arthritis, severe shock, allergic conditions, and chronic lymphatic leukaemia.

Dose: The dosage for adults is 20–100 mg per day by oral or IM.

ii. Hydrocortisone (Hydrocortone, Lortef)



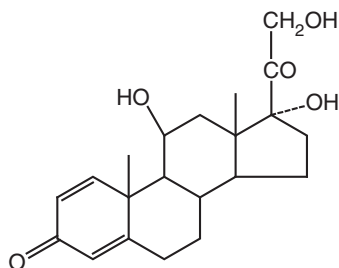
Synthesis



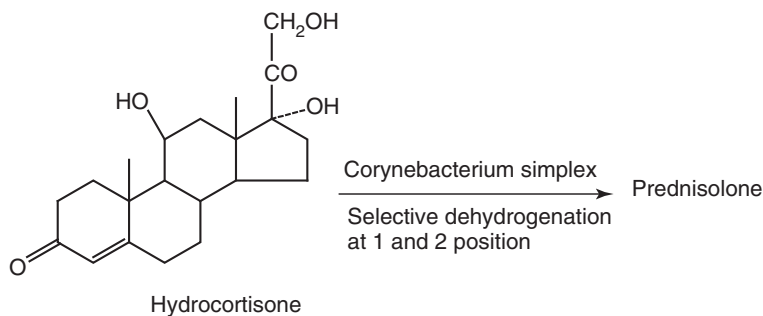
Properties and uses: It exists as white crystalline powder, soluble in water and in alcohol. It is used as an anti-inflammatory agent.

Dose: The dose as injection is 100 mg intramuscular (IM) and as topical cream 1%–2.5% for skin, ear, and eye.

iii. Prednisolone (Prelone, Emsolone)



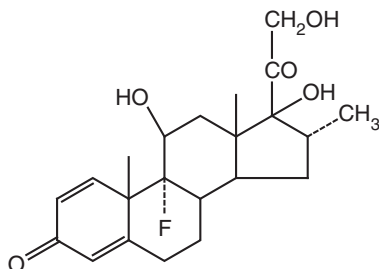
Synthesis



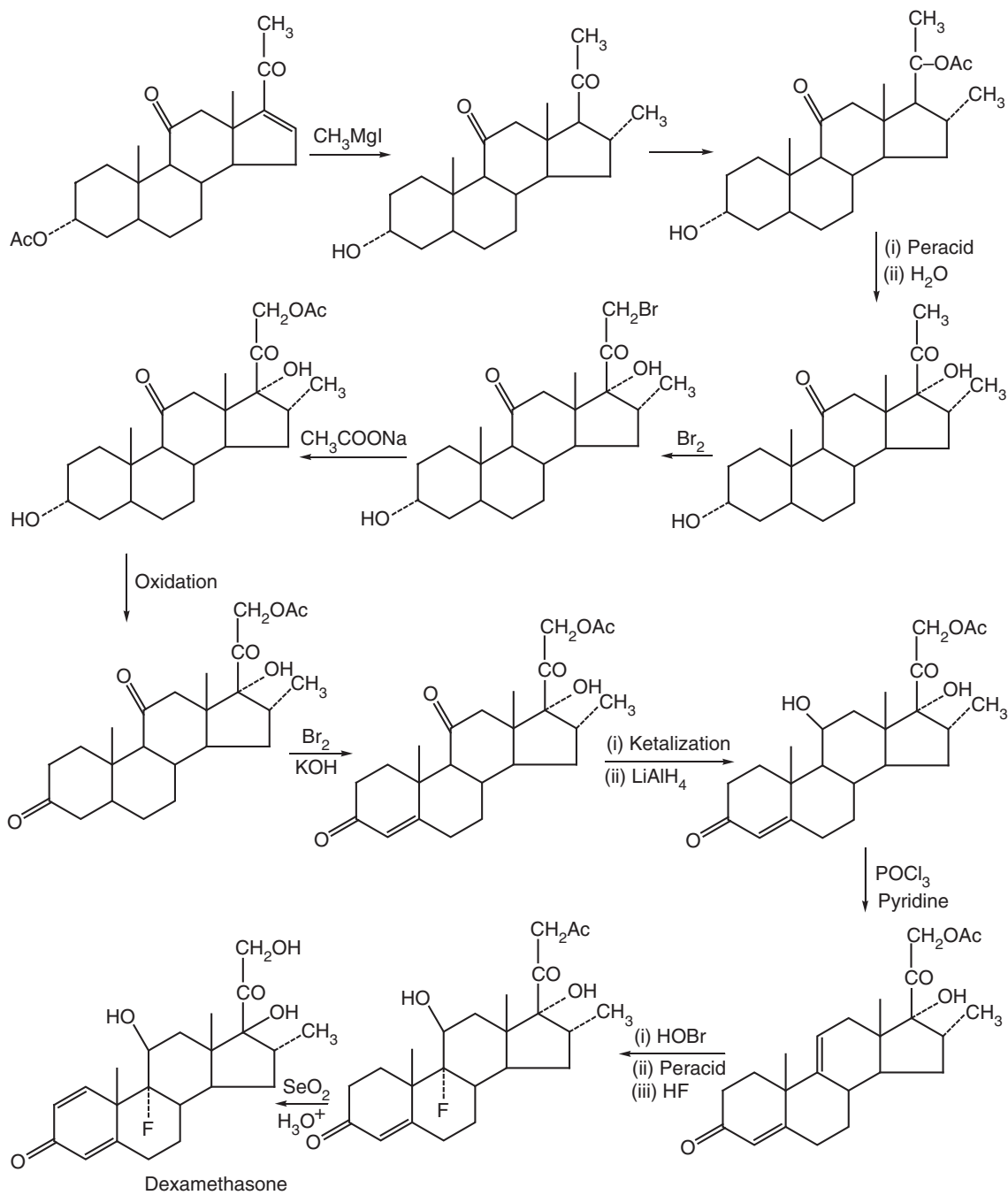
Properties and uses: It is a white crystalline powder, sparingly soluble in alcohol. It is four times as potent as hydrocortisone.

Dose: The oral dose for adult is 5–60 mg per day. As IM, IV, and intra-articular (IA) injection, the dose is 10–40 mg, and for topical use (skin and eyes), the dose is 0.25%.

iv. Dexamethazone (Dalalone)



Synthesis



Properties and use: It exists as white crystalline powder, soluble in alcohol and insoluble in water. Used as an anti-inflammatory and antiallergic drug.

Dose: Oral adult dose is 500 µg to 9 mg daily. The topical dose for conjunctiva is 1 drop of 0.1% suspension.

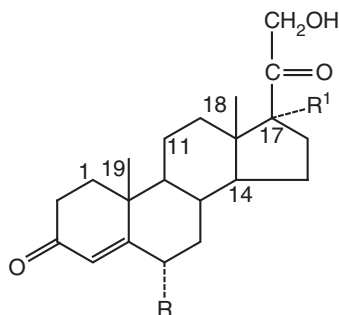
PROGESTOGENS

The natural progestational hormone or progestogen is progesterone, which is secreted mainly by the corpus luteum in the second part of the menstrual cycle. Small amounts are also secreted by the testis in the male and the adrenal cortex in both sexes, and large amounts are secreted by the placenta.

Classification

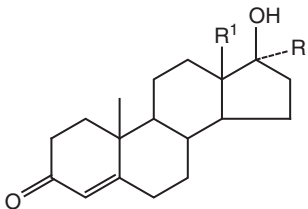
Progestogens could be broadly classified into two major classes:

1. Progesterone derivatives



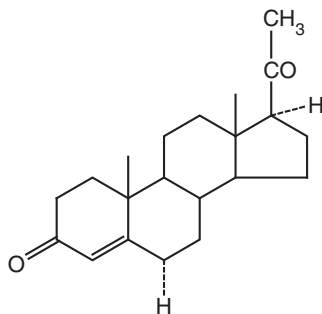
Name	R	R ¹
Progesterone	-H	-H
Hydroxy progesterone caproate	-H	-OCO(CH ₂) ₄ CH ₃
Methoxy progesterone acetate	-CH ₃	-OCOCH ₃

2. 19-Nor testosterone derivatives



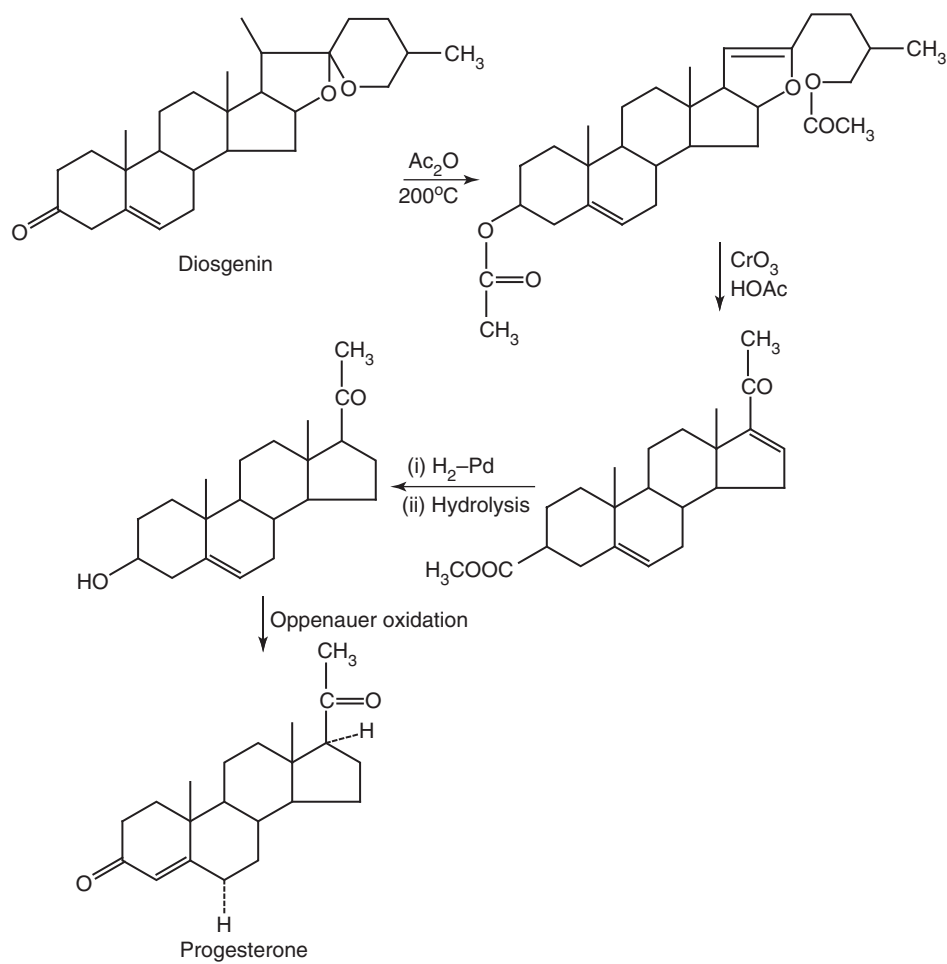
Name	R	R ¹
Norethisterone, Norethindrone	-C≡CH	-CH ₃
Norgestrel	-C≡CH	-C ₂ H ₅
19-Nortestosterone	-H	-CH ₃

i. Progesterone (Alza)

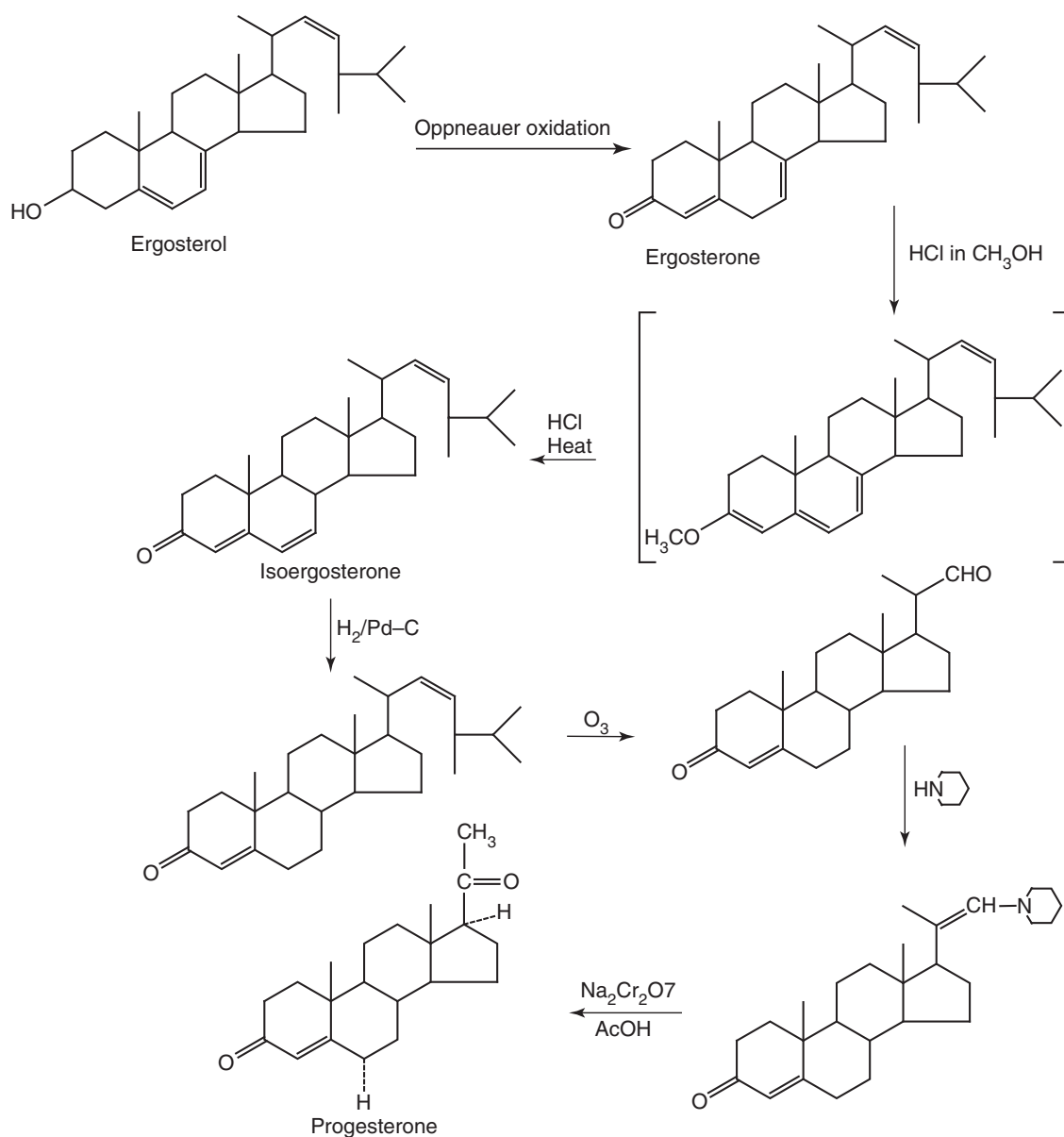


Synthesis

Method-I From: Diosgenin



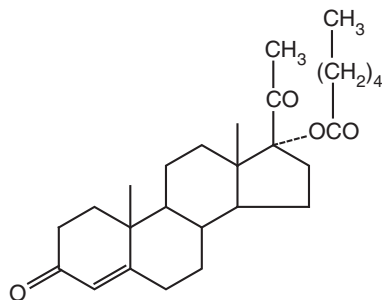
Method-II From: Ergosterol



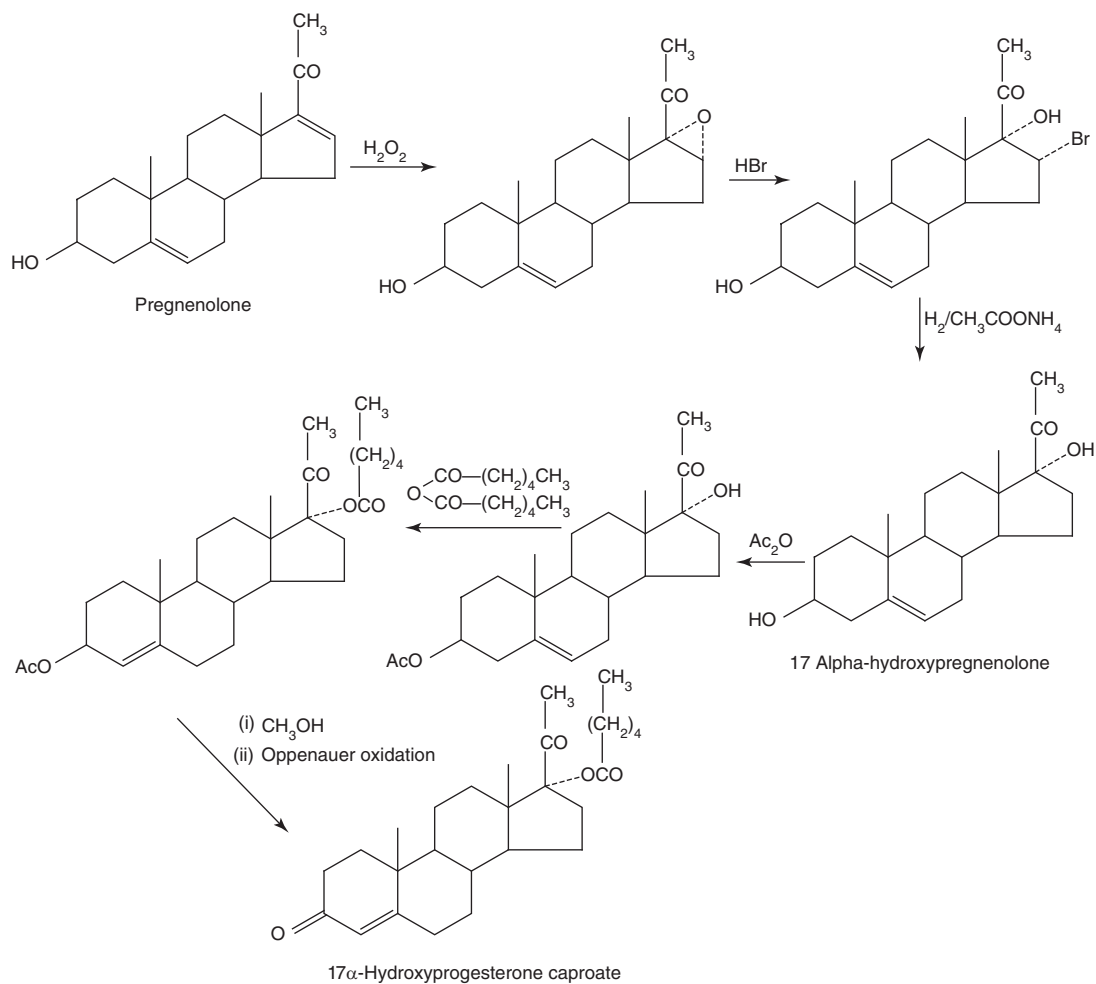
Properties: It exists as white crystalline powder, insoluble in water and in alcohol.

Dose: The dose for uterine bleeding is 5–10 mg injected per day up to 5–10 days. For habitual abortion, the dosage is 5–20 mg twice or thrice a week by IM injection.

ii. Hydroxyprogesterone caproate

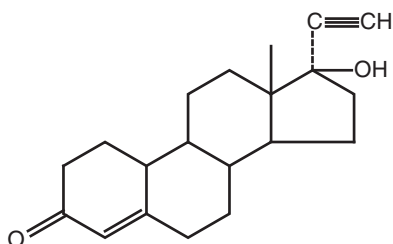


Synthesis

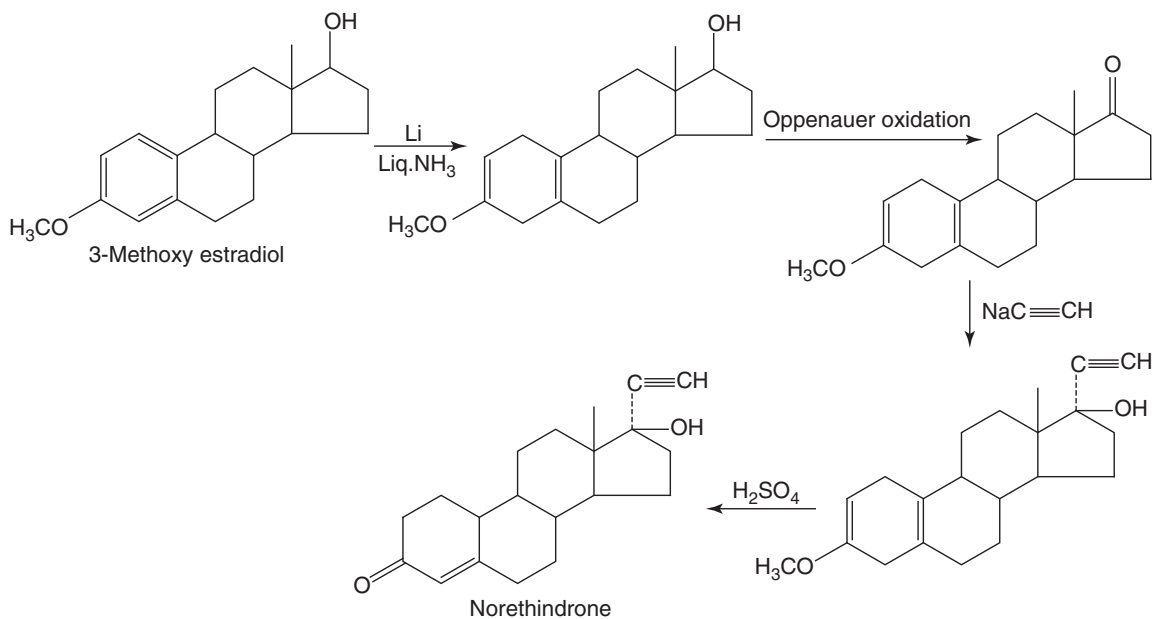


Properties and uses: It exists as white crystalline powder, insoluble in water, it is more potent than progesterone, and has longer duration with short onset of action.

iii. Norethindrone (Norethiesterone, Micronor)



Synthesis

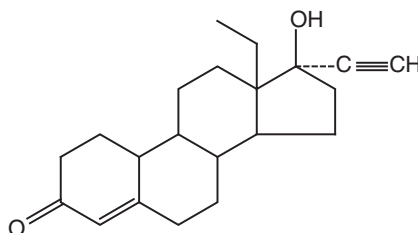


Properties and uses: It exists as white crystalline powder, insoluble in water. It is an important oral contraceptive and has the ability to postpone menstruation and prevent ovulation by suppressing pituitary gonadotropin. It is used in combination with mestranol and ethinestradol.

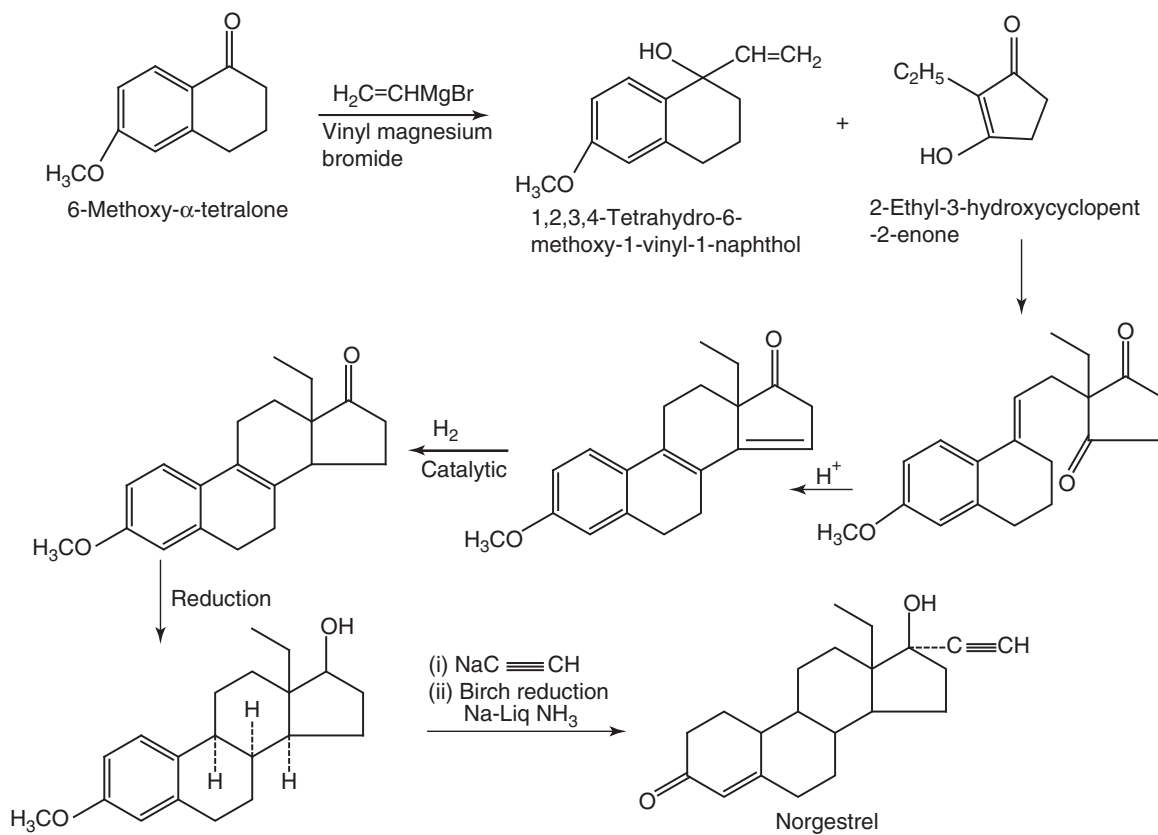
Assay: Dissolve the sample in tetrahydrofuran, add silver nitrate, and titrate the solution with 0.1 N NaOH. Determine the end point potentiometrically.

Dose: The oral dose for contraception is 2.5–10 mg daily for 21 days.

iv. Norgestrel (Ovrette, Ovval)



Synthesis



Properties and uses: It exists as white crystalline powder, insoluble in water, slightly soluble in alcohol. Used as an oral contraceptive.

Dose: The oral dose as a single agent is 75 μg per day.