

### 26.1.3. Individual Compounds

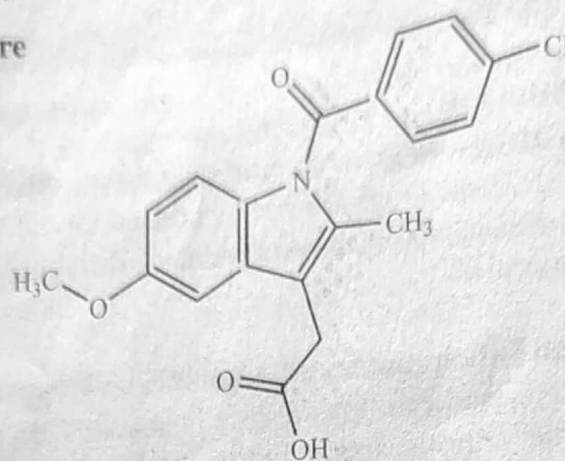
The following drugs are studied in detail:

- 1) Indomethacin,
- 2) Phenylbutazone,
- 3) Oxyphenbutazone, and
- 4) Ibuprofen.

#### 26.1.3.1. Indomethacin

Indomethacin is a non-steroidal anti-inflammatory agent which also contains analgesic and antipyretic activity.

##### Chemical Structure



Indomethacin

**Molecular Formula:**  $C_{19}H_{16}ClNO_4$

**IUPAC Nomenclature:** 2-[1-(4-chlorobenzoyl)-5-methoxy-2-methyl-1H-indol-3-yl]acetic acid

**Properties:** Indomethacin occurs as a pale yellow to yellow tan coloured crystalline powder with either a faint odour or no odour at all, and a slightly bitter taste. It is almost insoluble in water; and soluble in ethanol, acetone, and ether.

**Uses:** Indomethacin is used for treating moderate to severe rheumatoid arthritis as well as acute flares of chronic disease, osteoarthritis, ankylosing spondylitis, acute painful shoulder (bursitis and/or tendinitis), and acute gouty arthritis.

**Stability and Storage Conditions:** Indomethacin is light-sensitive, thus should be stored in tightly-closed light-resistant containers at temperatures below  $30^{\circ}\text{C}$ , which should never exceed above  $50^{\circ}\text{C}$ , and should not be frozen. It is stable in air and heat under normal conditions. It is also stable in neutral or slightly acidic media and gets decomposed by strong alkali.

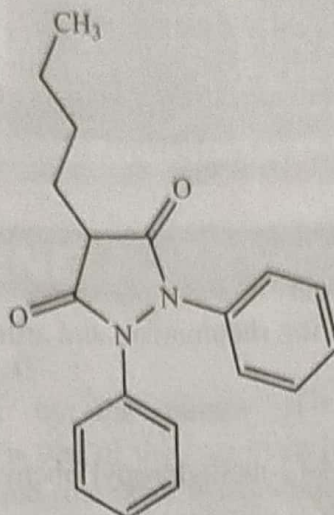
**Types of Pharmaceutical Formulations:** Suppositories, tablets, capsules, and drops.

**Brand Names:** Indocin, Tivorbex, Indocin IV, and Indocin SR.

#### 26.1.3.2. Phenylbutazone

Phenylbutazone is a butyl-diphenyl-pyrazolidinedione which contains anti-inflammatory, analgesic, and antipyretic activities.

## Chemical Structure



Phenylbutazone

**Molecular Formula:**  $C_{19}H_{20}N_2O_2$ .

**IUPAC Nomenclature:** 4-butyl-1,2-diphenylpyrazolidine-3,5-dione.

**Properties:** Phenylbutazone occurs as a white or off-white coloured crystalline powder with no odour. It has a faintly bitter aftertaste. It is readily soluble in ether, acetone, and ethyl acetate.

**Uses:** Phenylbutazone is used for efficient treatment of backache and ankylosing spondylitis. It is also used in rheumatoid arthritis and Reiter's syndrome.

**Stability and Storage Conditions:** Phenylbutazone is stable at room temperature, however in the absence of moisture. It should be stored in well-closed containers in a refrigerator maintained at 2-8°C temperature.

**Types of Pharmaceutical Formulations:** Capsules and tablets.

**Brand Names:** Flanil, Aristopyrin, and Zolandin.

### 26.1.3.3. Oxyphenbutazone

Oxyphenbutazone is a non-steroidal anti-inflammatory drug and a metabolite of phenylbutazone obtained by the hydroxylation of one of the phenyl rings at position 4.

**Molecular Formula:**  $C_{19}H_{20}N_2O_3$

**IUPAC Nomenclature:** 4-butyl-1-(4-hydroxyphenyl)-2-phenylpyrazolidine-3,5-dione

**Properties:** Oxyphenbutazone occurs as a white to yellowish white coloured powder with no odour. It is very faintly soluble in water; and readily soluble in acetone.

**Uses:** Oxyphenbutazone eye drops are used for managing postoperative ocular inflammation, episcleritis, and superficial eye injuries.



**Stability and Storage Conditions:** Oxyphenbutazone should be stored at room temperature away from sunlight and moisture.

**Types of Pharmaceutical Formulations:** Tablets and eye drops.

**Brand Names:** Sioril and Oxybutazone.

#### 26.1.3.4. Ibuprofen

Ibuprofen is a non-steroidal anti-inflammatory agent containing analgesic properties. It is used for treating rheumatism and arthritis.

**Molecular Formula:**  $C_{13}H_{18}O_2$

**IUPAC Nomenclature:** 2-[4-(2-methylpropyl)phenyl]propanoic acid.

**Properties:** Ibuprofen occurs as a nearly white coloured crystalline powder with a unique odour. It is water insoluble; readily soluble in alcohol, ether, and chloroform; and soluble in alkali hydroxide and carbonate solutions.

**Uses:** Ibuprofen is prescribed for treating the symptoms of rheumatoid arthritis, osteoarthritis, and juvenile rheumatoid arthritis. It may be used for treating mild to moderate pain and for managing dysmenorrhoea. It may be used for reducing fever. It has also been used for the treatment of ankylosing spondylitis, psoriatic arthritis, and gout. It may also be used for reducing pain, fever, and pericarditis inflammation. It may be used intravenously along with opiates to get relief from moderate to severe pain. Ibuprofen lysine may be used intravenously for treating Patent Ductus Arteriosus (PDA) in premature neonates.

**Stability and Storage Conditions:** Ibuprofen tablets should be stored in light-resistant, tightly-closed containers at 15-30°C temperature.

**Types of Pharmaceutical Formulations:** Oral suspensions, tablets, capsules, injections, and oral solutions.

**Brand Names:** Advil, Motrin, Actipufen, and Proprinal.