Tishk International University
Faculty of Pharmacy / 2nd Year
Practical Organic Chemistry II
Experiment 04

Extraction of Ibuprofen from commercial drugs

Experiment 04
Extraction of Ibuprofen

Ibuprofen: A nonsteroidal anti-inflammatory drug (**NSAID**) that is commonly used to treat pain, swelling, and fever. Common brand names of ibuprofen include Advil, Motrin, and Nuprin.

a white powder, used especially in the treatment of rheumatoid arthritis andosteoarthritis as an anti-inflammatory, analgesic, and antipyretic.

Some commercial names

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- Ibuprofen is derived from propionic acid.
- Its initial development was in 1960.
- Ibuprofen was finally patented in 1961 and this drug was first launched against rheumatoid arthritis in the UK in 1969 and USA in 1974.
- On the available products, ibuprofen is administered as a racemic mixture.
- The S-enantiomer is believed to be the more pharmacologically active enantiomer.

Physical properties

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

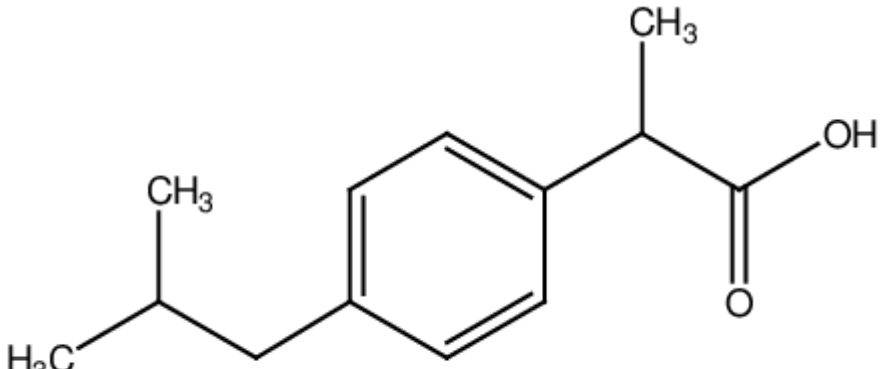
Molecular Weight: **206.29 g/mol**

IUPAC name: **2-(4-Isobutylphenyl) propanoic acid.**

Density: **1.029 g/cm^3**

Melting point: **76 °C**

Boiling point: **157 °C**



Ibuprofen

Solubility

- Ibuprofen is practically insoluble in water 21 mg/L (at 25 °C).
- Very soluble in most organic solvents like ethanol (66.18 g/100mL at 40 °C for 90% EtOH), methanol, acetone and dichloromethane.
- **Home work: explain the solubility in the solvents ?**

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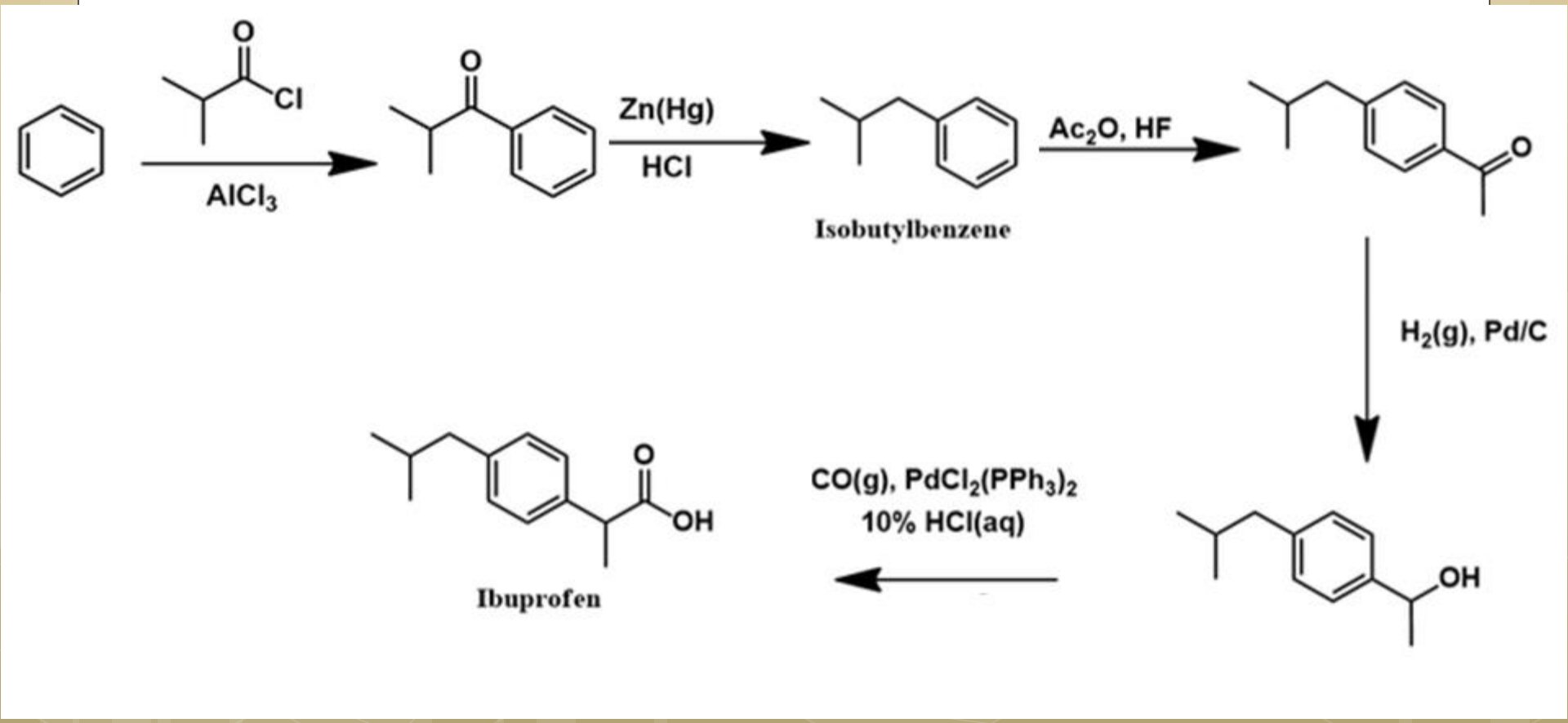
Ibuprofen is used for the treatment of mild to moderate pain, inflammation and fever caused by many and diverse diseases. It is used for treating menstrual cramps (dysmenorrhea), osteoarthritis, rheumatoid arthritis, and juvenile idiopathic arthritis. Intravenous ibuprofen is used for treating patent ductus arteriosus.

The most common side effects from ibuprofen are:
rash, ringing in the ears, headaches, dizziness, drowsiness, abdominal pain, nausea, diarrhea, constipation, and heartburn

Preparation of Ibuprofen



Procedure:

- Weigh 3 pills of ibuprofen.
- Remove the film coting.
- Following that, grind the pills using a mortar and a pestle.
- Put the powder in a breaker and add 10 ml of acetone.
- Stir the mixture for 2 minutes and make a filtration to get the filtrate.
- Evaporate the acetone.
- Scratch the residue in the flask to obtain the ibuprofen.