



**Assembled by:**

**Dr. Ambika Kumar**

**Asst. Professor**

**Dept. of Chemistry**

**B. N. College Bhagalpur**

**E-mail ID:**

**[kumarambika.1115@gmail.com](mailto:kumarambika.1115@gmail.com)**

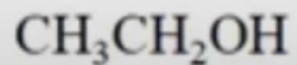
**Contact No. 7542811733**



**TOPIC: RECOVERY OF  
GLYCEROL FROM SPENT LYE**

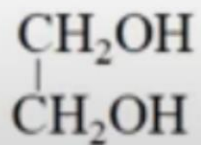
# Introduction

- Compounds which contain three –OH groups are called Trihydric alcohols.
- An increase in the number of –OH groups enhances the hydrogen bonding ability and association, thereby raising the boiling point. It can be seen in the following example.



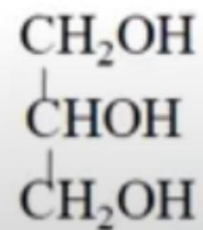
Ethyl alcohol

(b.pt 78.5°C)



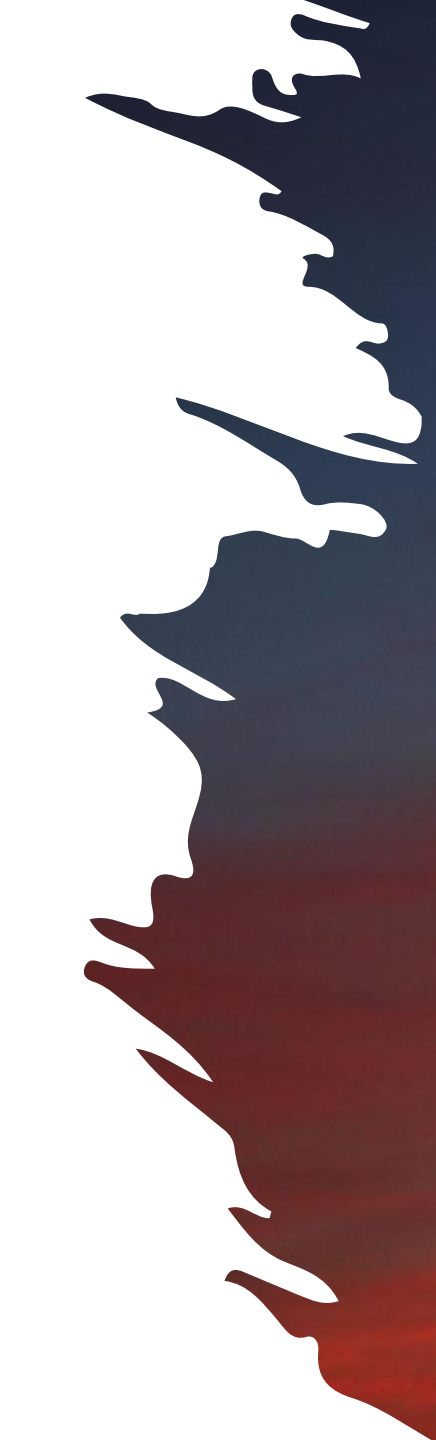
Ethylene glycol

(b. pt 197°C)



Glycerol

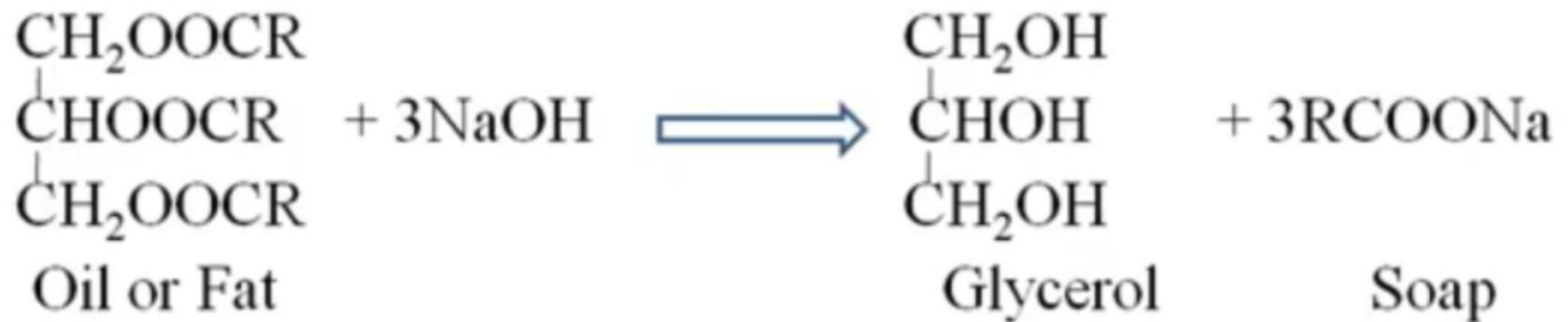
(b.pt 290°C)

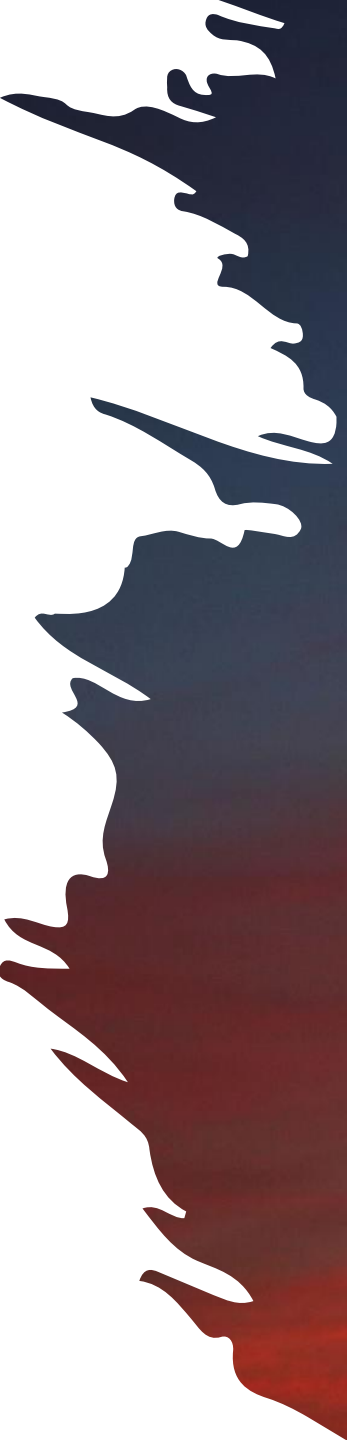


Glycerol, 1,2,3-propanetriol is the most important trihydric alcohol, formerly known as *Glycerine*, which is thick, syrupy, colourless liquid. It is non-toxic and an excellent *humectant* (moisture retaining agent), therefore it is used in the preparation of products like soap, hand lotion, vanishing creams etc.

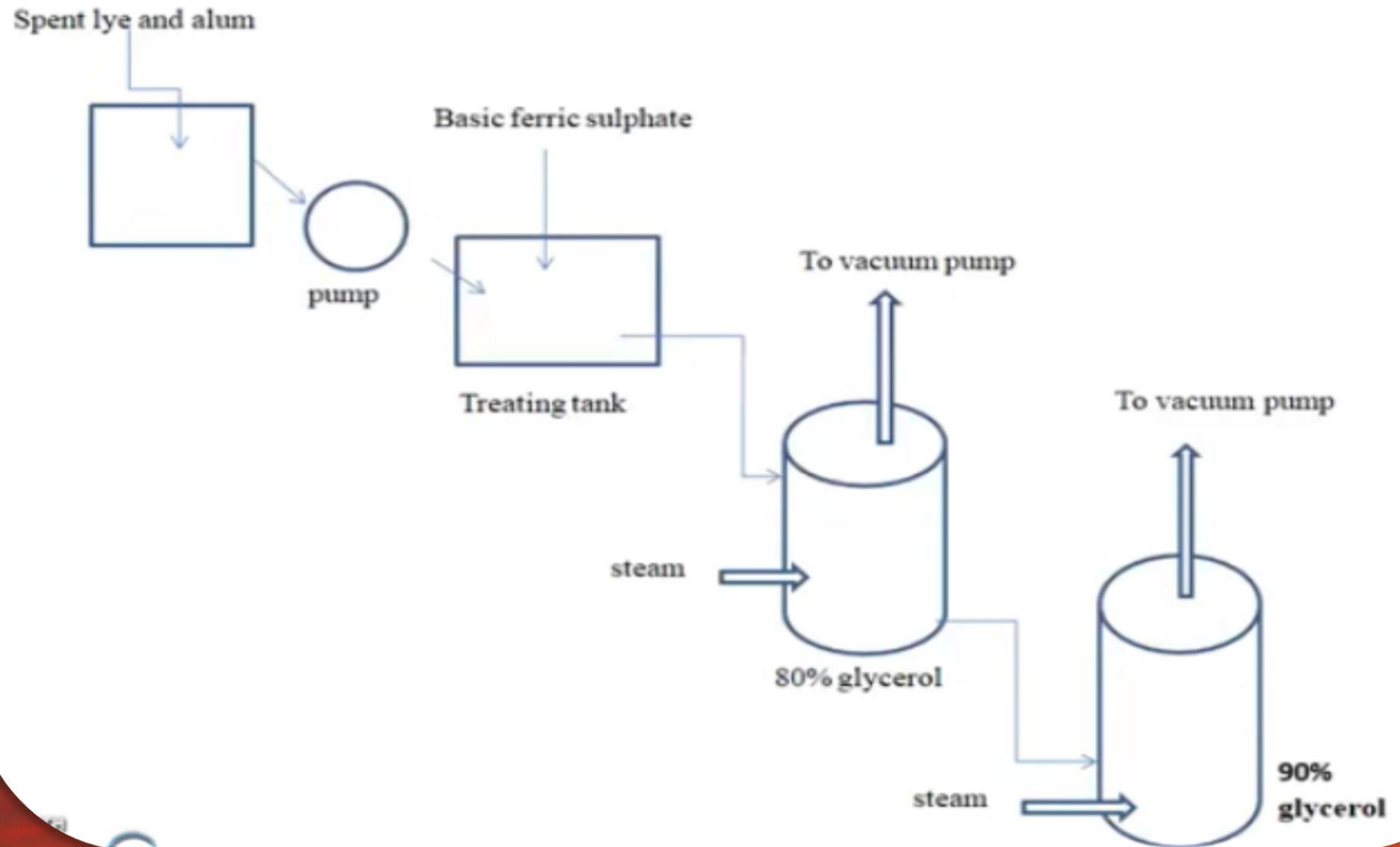
## Preparation of Glycerol from spent lye

- Glycerol can be manufactured from fats and oils. Natural oils and fats are triesters of glycerol and long chain carboxylic acids, mainly palmitic, steric and oleic acids.
- In the soap industry when the oil or fat is hydrolysed with NaOH solution, sodium salt of higher fatty acid (i.e. soap) is produced and glycerol is obtained as a by-product.

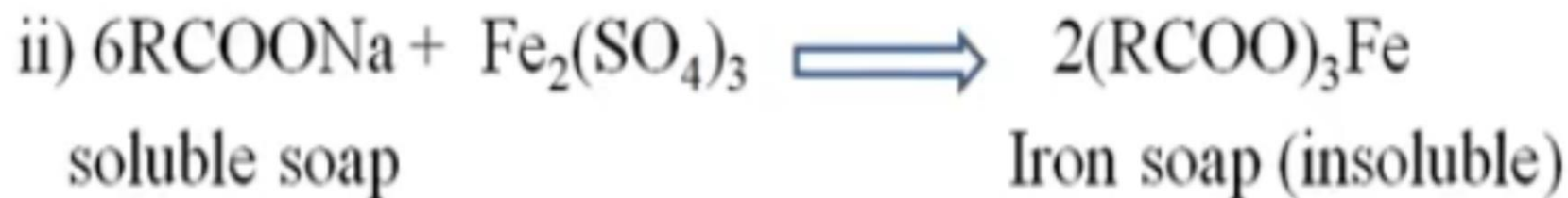


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- Soap is separated out by filtration and the filtrate is known as *spent lye*.
  - Besides glycerol spent lye contains free alkali, sodium chloride, some soluble soap, suspended impurities and water.
  - The flow sheet diagram of recovery of glycerol is as shown.
  - Alum is added to spent lye and is allowed to stand where suspended impurities settle down.
  - The clear solution is transferred to a treating tank, where it is first treated with HCl to neutralised some unreacted alkali.

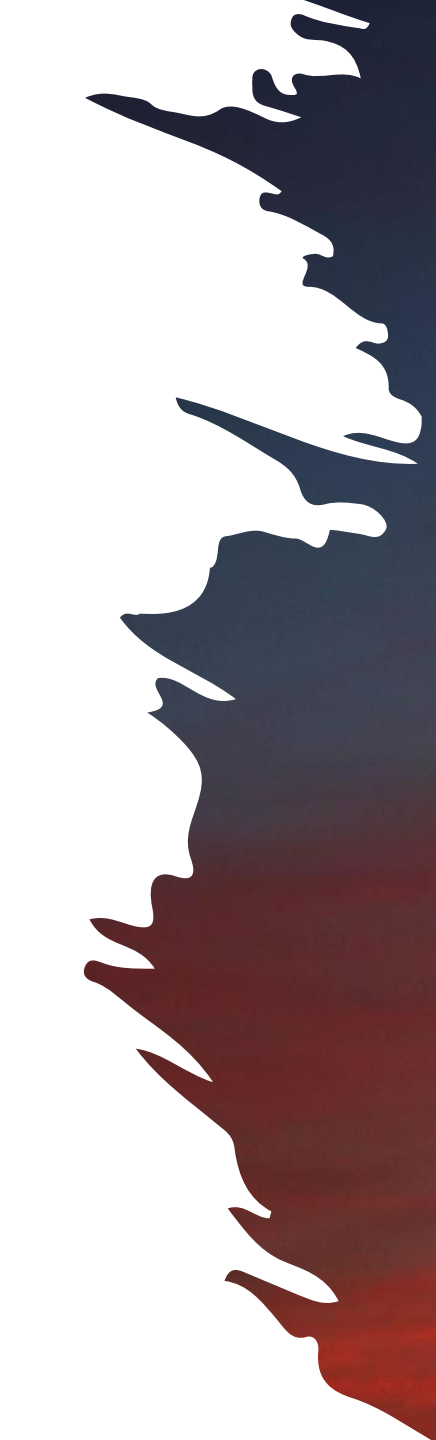
## Flow sheet diagram for recovery of glycerol



- Then a calculated amount of basic ferric sulphate (or aluminium sulphate) is added to it. This will precipitate remaining alkali as ferric hydroxide and a soluble soap as insoluble iron (or aluminium) soap.





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- These impurities are filtered out, and the filtrate is then concentrated under vacuum.
  - The filtrate is treated with animal charcoal to remove coloured impurities.
  - It is again subjected to vacuum distillation, where the glycerol thus obtained is 90% pure.

