



## PROJECT REPORT ON

**"Preparation of picric acid from phenol & estimation of picric acid"**

**Submitted By**

M.Sc. SEM I Students (Roll No.10 to 16)

**Guided By**

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**Submitted To**

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Sir P.T.Science College, Modasa

# SIR P.T.SCIENCE COLLEGE, MODASA

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## Certificate

This is to certify that project report entitled "Preparation of Picric Acid from Phenol & Estimation of Picric Acid" are carried out by students mentioned below. They have been satisfactorily completed their project work for academic year 2022-23. The project has been approved as it satisfies the academic requirement in respect of project work prescribed for the Master of Science. *M.Sc-I*

| Roll No. | Student's Name             |
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Place: Modasa

Signature of Guide

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Signature of P. G. In charge

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## Phenol :

Phenol also called carbolic acid is an aromatic organic compound with the molecular formula  $C_6H_5OH$  it is a white crystalline solid that is volatile. The molecule consist of a phenol group (-OH) midly cidic it requires careful handling because it can chemical burns

## Use :

phenol is also versatile presursos to a large collection of drugs, most notbly aspirin but also many herbicides and pharmaceutical's drugs, most notably aspirin but also many hebicides and pharmacuticles drugs.

## Homo annular six member

Properties : cyclic cpd base value =  $253nm + 6 = 259 nm$

1. chemical formula :-  $C_6H_6O$
2. molar mass :- 94.113 GM/MO
3. appearance :- LIQUID
4. melting point :- 40.5 C (104.9 F , 313.6 K)
5. boiling point :- 181.7 C (359.1 F , 454.8K)
6. uv- vis ( $\lambda_{max}$ ) :- 270.75nm

## PICRIC ACID :

picric acid is a organic compound with the formula  $(O_2N)_3C_6H_2OH$ . its iupac name is 2,4,6- trintro phenol (tnp). the name picric comes from areek : pikros, meaning " bitter" due to its bitter taste. it is one of the most acidic phenols, like other strongly nitrated organic compound ,picric, acid is an explosive, which is its primary use. it has also been used as medicine and as a dye.

## USE :-

picric acid has been used for pharmacies as an antiseptic and as a treatment for burns, malaria, herpes and smallpox

## PROPERTIES :

1. chemical formula :-  $C_6H_3N_3O_7$
2. molar mass :-  $229.10 \text{ gm.mol}^{-1}$
3. appearance :- colourless to yellow solid
4. melting point :-  $-122.5 \text{ c (} 252.5 \text{ f , } 395.6 \text{ k)}$
5. boiling point :-  $>300 \text{ c (} 572 \text{ f, } 573 \text{ k)}$

Lab present work : preparation of 2,4,6 tri nitro phenol (picric acid) from phenol

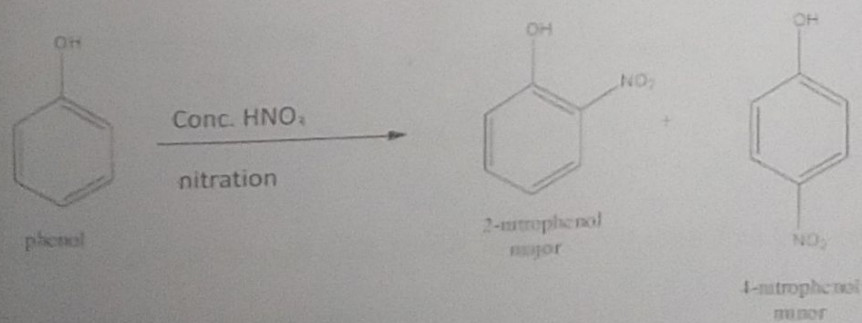
Phenol :- 2gm

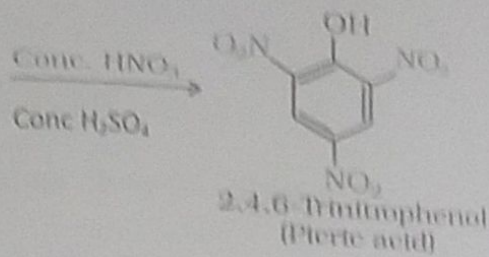
Conc.  $H_2SO_4 = 3.5 \text{ ml}$

Conc.  $HNO_3 = 12.5 \text{ ml}$

### 1. From nitration of phenol: -

Picric acid can be prepared by direct nitration of phenol but the yield is very poor due to loss of phenol by oxidation with nitric acid





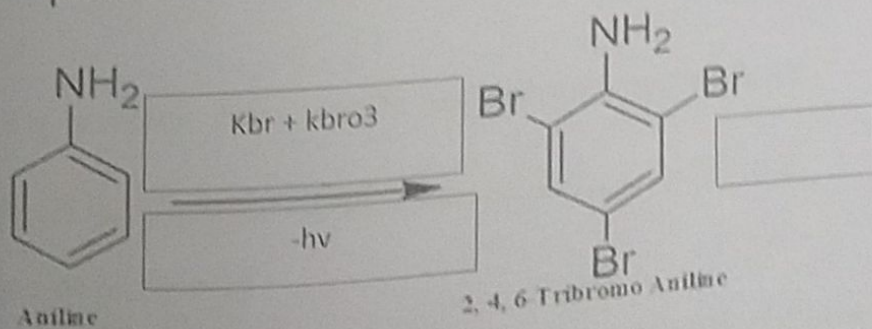
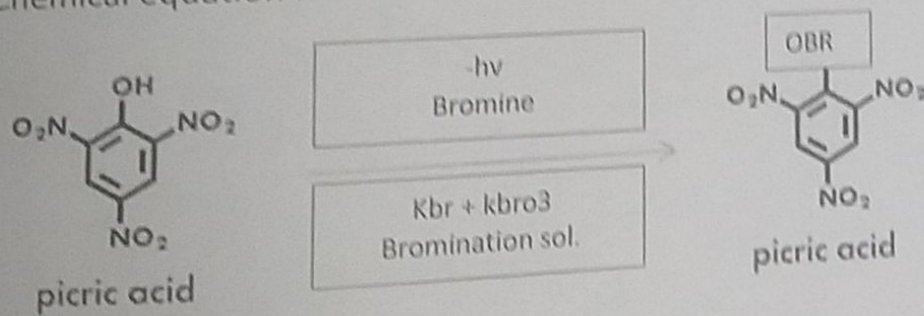
### Estimation of Picric Acid

Procedure as aniline

#### Procedure:

1. Take 10 ml of concentrated hydrochloric acid and 20 ml of water in a beaker and add 4.5 ml of aniline to the mixture.
2. Dissolve the mixture thoroughly to get a clear solution.
3. Cool the solution by placing it in an ice bath at 5 °C.
4. Mix 4 g of sodium nitrite to 20 ml of water.

Chemical equation :



Picric acid 2.0 gm dissolve in 10% Naoh. Minimum make to 1 litre stock solution

R.B I,II,III :- 25.0 ml diluted picric acid sol.

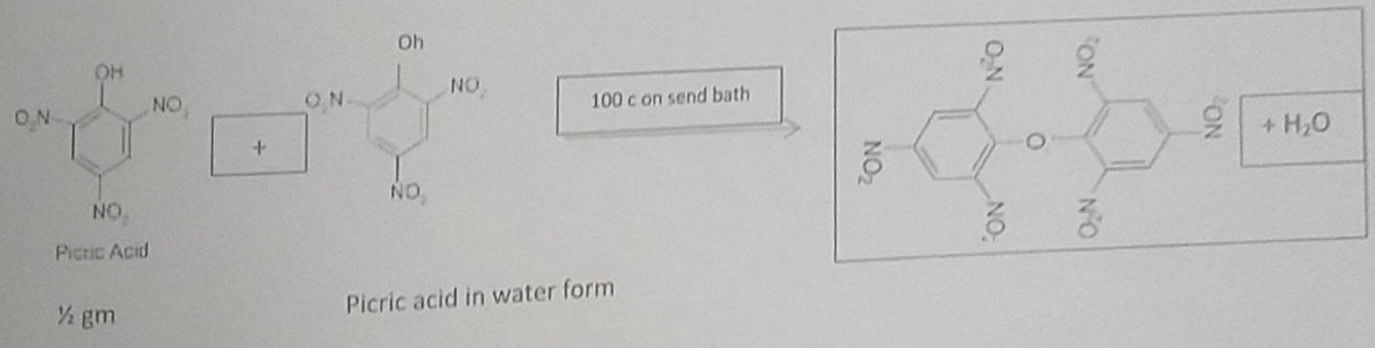
+ 25 ml ddw

- + 5 ml 10 % Naoh
- + 25 ml brominating sol. (0.1 N approx.)
- Form brominating in a dark place for 30 mn.
- + 10 ml (1/2 T.T) KI sol
- + starch indicator
- Filter with 0.1N  $\text{Na}_2\text{S}_2\text{O}_3 \cdot 5\text{H}_2\text{O}$  SOL.

C.C. : colourless  
 1000ml = 0.200 m  
 25 ml = ?

$$200 \times 25 / 1000 = 0.5 \text{ gm}$$

➤ Picrate derivative of picric acid chem. Equation



Empty watch glass weight with derivative = 10.39  
 Wt of empty watch glass = 10.02  
 Wt of picric acid = 0.37

Estimation of picric acid by following bromination method

1 gm → ~ 1 gm  
 0.5 gm → = 0.39 gm  
 picric acid

(Standard melting Point of picric acid = 122.5 c)

Derivative melting point : 121 C

## Reference

1. WIKIPEDIA
2. GOOGLE
3. SAI PRAKASHAN (BOOK)