

M.SC Semester III

Core Course XII

Environmental Chemistry

**TOPIC:-Unit IV, APPLICATIONS OF GREEN CHEMISTRY
APPLICATION 2**

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APPLICATION 2

ENVIRONMENTALLY FRIENDLY CATALYSIS



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ENVIRONMENTALLY FRIENDLY CATALYSIS

- ⦿ Also called “green catalysis”
- ⦿ Has a lot of advantages when compared to classical type of catalysis
- ⦿ Recently found method (~15 years)

CLASSICAL CATALYSIS METHOD

- ⦿ Named as “Homogeneous Catalysis”
- ⦿ They are dumped to environment after use
- ⦿ Causing huge pollution problems
- ⦿ Financially ineffective

NEW METHOD OF CATALYSIS

- ⦿ Named as “Heterogeneous Catalysis”
- ⦿ Can be used over and over
- ⦿ Increases productivity
- ⦿ Saves a lot of money

EXAMPLE SYNTHESIS

Old process	New Process
Phenol, acetone HCl, H ₂ SO ₄ (100%), NaOH (100%) H ₂ O	Phenol, acetone
↓	↓
Reaction HCl/H ₂ SO ₄ -solution	Reaction catalyst: ion-exchange resin
1.0 t BPA 3.3 t waste water 0.3 t salts emission 6.0 kg COD	1.0 t BPA – 90% waste water – 99% salts emission – 94% COD

CURRENT SITUATION

- Environmentally Friendly Catalysis:
 - Subsequently reduced the catalyst costs
 - Has earned the second biggest share in the market
 - With high selectivity, operating costs went down