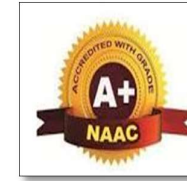




Savitribai Phule Shikshan Prasarak Mandal's
SKN SINHGAD COLLEGE OF ENGINEERING
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DEPARTMENT OF CIVIL ENGINEERING



ENERGY FROM PLASTIC WASTE: PYROLYSIS



Pyrolysis is a process that converts plastic waste into energy, fuel oils, gases, or Chemicals through thermal decomposition in the absence of oxygen. Here's an overview:

Process:

1. Collection and sorting of plastic waste
2. Shredding or grinding into small pieces
3. Heating in a pyrolysis reactor (300-800°C) without oxygen
4. Decomposition into:
 - Fuel oils (diesel, gasoline, etc.)
 - Gases (syngas, methane, etc.)
 - Solids (carbon black, etc.)
5. Cooling and condensation of vapours
6. Collection and refining of products

Benefits:

- Energy generation from waste
- Reduction of plastic waste in landfills and oceans
- Production of high-quality fuels and chemicals
- Lower greenhouse gas emissions compared to traditional fossil fuels

Products:

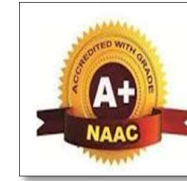
1. Fuel oils (diesel, gasoline, etc.)
2. Gases (syngas, methane, etc.)
3. Solids (carbon black, etc.)
4. Chemicals (ethylene, propylene)

Applications:

1. Electricity generation
2. Industrial processes (heat, power)
3. Transportation fuels
4. Chemical manufacturing



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REVERSE OSMOSIS



Osmosis (RO) is a popular low-cost water purifier technology that removes impurities from water by applying pressure to force it through a semi-permeable membrane. Here's an overview:

How it works:

1. Pre-treatment: Water passes through a sediment filter to remove larger particles.
2. Pumping: Water is pressurized to force it through the RO membrane.
3. Filtration: Water passes through the semi-permeable membrane, which rejects impurities.
4. Post-treatment: Treated water may undergo additional filtration or disinfection.

Benefits:

- Effective removal of:
 - Heavy metals
 - Bacteria
 - Viruses
 - Parasites
 - Dissolved solids
- Low maintenance
- Affordable cost
- Compact design

Components:

1. RO membrane
2. Sediment filter
3. Activated carbon filter (optional)
4. Pump
5. Storage tank

Cost:

1. Initial investment: \$100-\$500
2. Replacement filters: \$20-\$100 per year

Limitations:

1. Water rejection (concentrate disposal)
2. Energy consumption
3. Membrane replacement required
4. May remove beneficial minerals

Innovations:

1. Energy-efficient pumps
2. Improved membrane technology
3. Integrated systems with UV/UF treatment