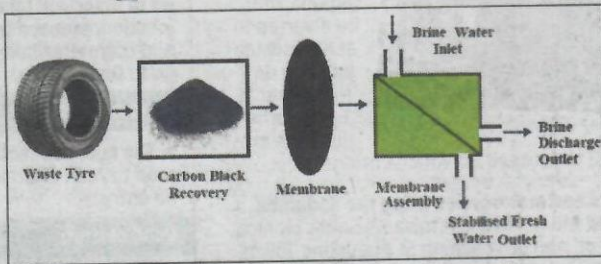


# BITS Goa prof to help retrieve membranes from old tyres, prove utility to purify water

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**Panaji:** Every year, approximately over one million tonnes of used tyres in India are either burned or dumped in landfills, posing a significant environmental threat. The leachate from these tires can contaminate groundwater. Now, an innovative and environmentally-friendly solution to recycle these scrap tyres has been proposed by a study by Sampatrao D Manjare and his research group from the department of chemical engineering at BITS Pilani K K Birla Goa campus.

Manjare's study is for the effective recovery and modification of carbon black from



Flow diagram of carbon black recovery from waste tyres and application in fabrication of membrane for water desalination

scrap tires. This modified carbon black derivative is to be applied in the fabrication of membranes for water desalination and purification.

According to pre-studies conducted by the research team comprising Manjare, Chandresh Dwivedi, and

Pranjali Gonde, the advanced heating approach to process scrap tyres results in reduced gas emissions and yields solid and liquid derivatives from the tyres. These derivatives can be reused in water purification processes.

As the study has larger so-

cial benefits, the Council of Scientific & Industrial Research (CSIR) of the government of India has granted funding of Rs 27 lakh to prove the concept before largescale implementations.

The CSIR-funded project is set to be completed within three years,

"The improper disposal of waste tyres is a major concern in India. Several studies across the globe indicate that a majority of used tyres end up either in landfill sites or are illegally burned, releasing hazardous leachate in groundwater or harmful gases into the air, thus polluting the environment," said Manjare.

► 'Primary goal', P 3

# 'Primary goal is to recover carbon black from end-of-life tyres'

## ► From P 1

Currently, the most common method for processing used tyres is pyrolysis heating, which involves heating the tires in the absence of oxygen to produce gases, carbon residue, and oil. However, conventional pyrolysis is environmentally unfriendly and has been banned in many places, although it is still used illegally, Manjare said.

To find a sustainable alternative, Manjare and his research team are using advanced heating techniques, specifically fast pyrolysis, using advance heating.

"The primary goal of the research is to recover carbon black from end-of-life tyres

using innovative heating methods and to modify its surface to enhance its suitability for membrane synthesis. The research involves detailed characterisation of the modified carbon. Subsequently, activated carbon-based membranes will be developed for water desalination and purification," said Manjare.

"The research will focus on studying membrane morphology, physico-chemistry, transport, separation, and fouling behavior," he said.

Pilot-scale testing of the membranes is also on the agenda. However, Manjare emphasised that this project is in the research phase and will need to undergo on-ground testing in the future.