



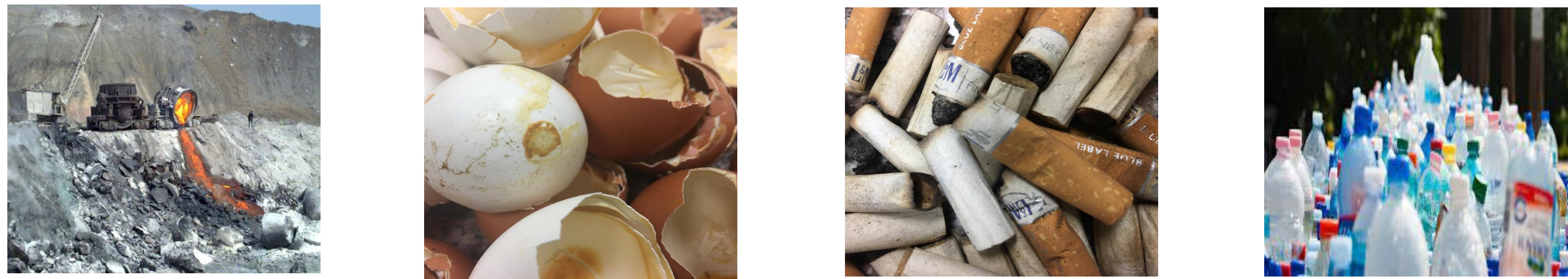
Innovative Recycling and Circular Economy Techniques for Waste Management and Freshwater Contamination Mitigation: Converting Steel Slag, Agricultural, and Plastic Waste into Valuable Nanocomposites and Adsorbents

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Background & Motivation

Among some of the numerous issues confronting our world today, two significant issues have piqued my interest:

1. Waste (steel slag wastes, Agriculture waste, and Plastic waste) which are causing landfill shortages and necessitating the development of innovative recycling and circular economy techniques.



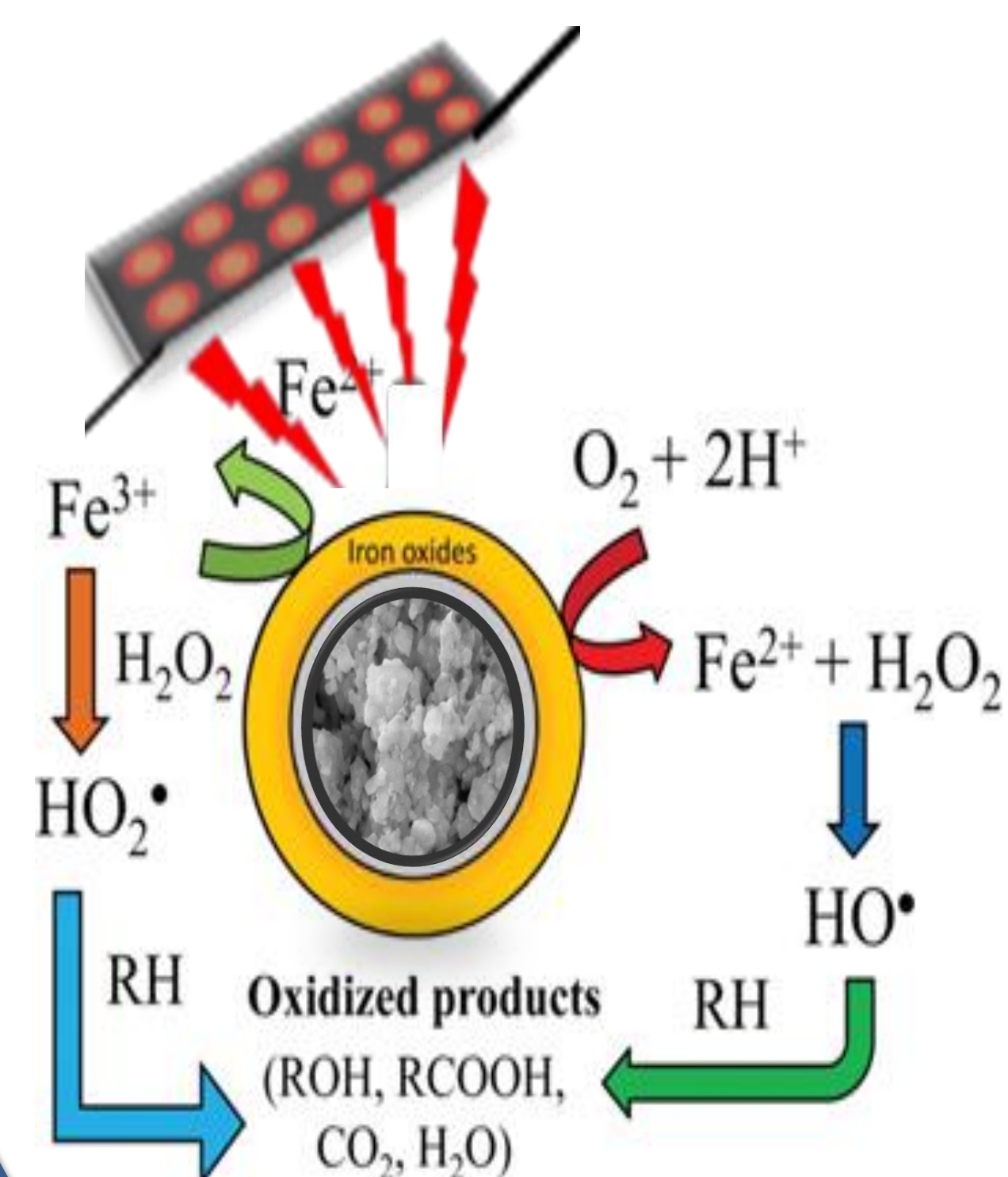
2. Freshwater contamination which needs to be resolved



Research Approach

Step 1

Steel slag wastes were converted to slag nanocomposite by solvothermal preparation Technique for wastewater Treatment in an Advanced Oxidation Process



Step 2

Agriculture and Plastic waste were converted to biochar, graphene, and activated carbon by thermal pyrolysis and applied as an adsorbent for the removal of organic contaminants and heavy metals from water

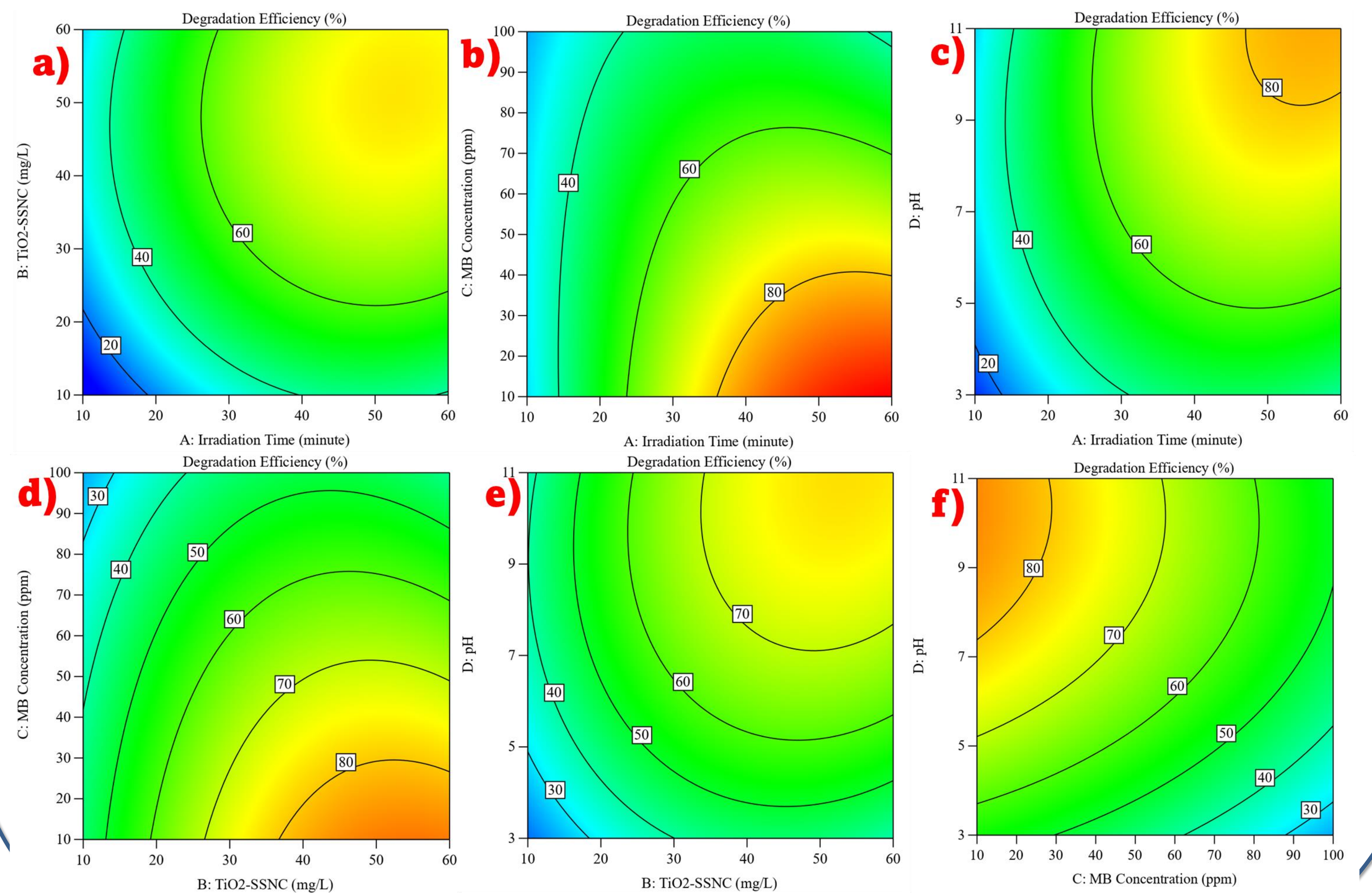
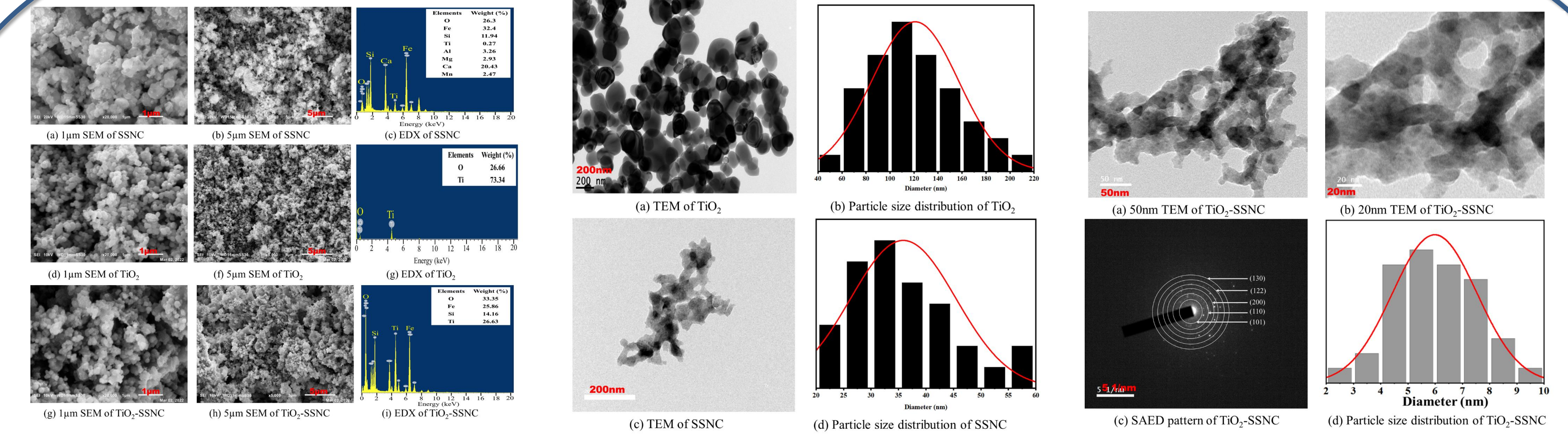


Step 3

Cigarette waste were converted to TiO₂/Zr impregnated with graphene oxide produced from plastic waste for CO₂ reduction and membrane desalination



Result and Discussion



Sustainable Development Goals Achieved

