

Research project and supervisory team

Supervisory Team	Dr. Paulo Debiagi Dr. Fathima Jerosha Ifthikar Ahmed Dr. Ubong Jerome Etim
Short introduction & description of research project	<p>The exponential growth of electronic waste (e-waste), projected to reach 74.7 million metric tons per year by 2030, presents a critical environmental and resource management challenge. E-waste comprises a complex mixture of plastics, metals, and hazardous materials that are difficult to recycle using conventional methods, resulting in significant resource losses and environmental hazards. Catalytic pyrolysis has emerged as a transformative approach for e-waste management, enabling the thermal decomposition of plastics into valuable products such as liquid fuels, syngas, and hydrocarbons. This research aims to develop efficient and cost-effective catalysts for e-waste pyrolysis while optimizing process parameters to maximize resource recovery. A robust experimental framework is proposed, including feedstock characterization, catalyst selection, pyrolysis experimentation, and product analysis using advanced techniques like GC-MS and FTIR. The investigation integrates computational chemistry for modeling and simulation of the reactive process and reactor dynamics. The study also evaluates the economic viability and environmental sustainability of catalytic pyrolysis through life cycle assessment. By addressing key challenges such as catalyst stability, scalability, and feedstock variability, this research seeks to contribute to a circular economy and sustainable development goals. The expected outcomes include the development of scalable, energy-efficient technologies for industrial applications, positioning catalytic pyrolysis as a viable solution for e-waste valorization.</p>
Contact points	Paulo.Debiagi@Nottingham.edu.cn