

AIR RESOURCES

- Ts Dr Khairunnisa binti Mohd. Pa'ad, Senior Lecturer (Head of IKohza)
- Professor Dr. Ezzat Chan bin Abdullah
- Ts Dr Nor Ruwaida binti Jamian, Senior Lecturer
- Ts Dr Abd Halim bin Md Ali, Senior Lecturer

NUMBER OF STUDENTS (AS FEB 15, 2022)

- Ph.D : 7 students
- Master: 14 students
- Bachelor: 9 students

RESEARCH KEYWORDS

Air Pollutions, Nanomaterials, Nanofibres, Environmental Engineering, Plasma Processing, Safety, Health & Environment

OUTLINE OF IKOHZA

The Air Resources group focuses on the safeguard of air resources or ambient air quality against man-made pollution. The research includes surveillance and quantification of pollutants that centres on detailed physical and chemical characterization of the pollutants in the ambient air or from stationary sources. The research is directed towards fine particulate size fraction that has a strong association with anthropogenic or man-made pollution sources, which is difficult to control and is known to impose health problems.

Recently, air resources ikohza also focused on Environmental Engineering, Nanomaterial's synthesis and characterization and safety, health and environment

CURRENT RESEARCH

- **AIR RELATED RESEARCH:**
Air Pollution Control Technology, Atmospheric Microplastics, Air Pollution Sampling & Monitoring, Development of Passive and Active Air Samplers
- **NANOMATERIALS:**
Synthesis of nanomaterials, electrospun fibres, graphene, carbon nanotube, synthesis of CO₂ absorbent, cancer nanomaterials, fuel cells
- **NON-THERMAL PLASMA:**
Non-plasma technology, plasma chemistry, plasma physics
- **ENVIRONMENTAL ENGINEERING:**
Non-agricultural waste management, occupational health and safety, disaster risk management



MERIT OF THE TECHNOLOGY

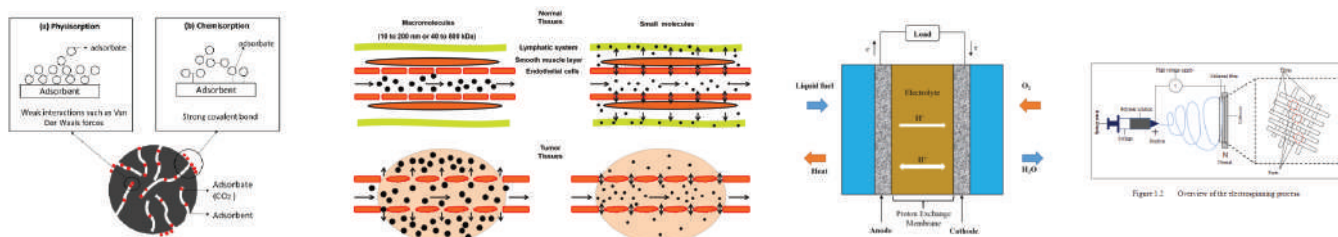
Air Resources iKohza is initially centered for the air pollutions and its solution. Recently, we also expanded our research expertise to nanomaterials, fuel cells and non-thermal plasma.

AIR RELATED RESEARCH:

Nowadays, for example biomass residue such as palm fibre and shell is used as fuel in the mill boiler to generate electricity. This process helps to dispose of the abundance of these waste materials. However, the combustion process releases tremendous number of particulates which can be harmful to the environment. Hence in this iKohza, we are committed to search for solution for these kinds of issues as we provide consultations and field sampling before analysing the samples physical and chemical properties.

NANOMATERIALS:

In this iKohza, biomass-based (e.g., carbon soot, banana peels, starch etc.) adsorbent is developed to adsorb carbon dioxide and heavy metals. The adsorbent either exist as nanoparticles or nanofibers. The synthesis of the nanoparticles is using electro spray method and the development of the fibre is using the electrospinning method. These two methods not only useful to make the adsorbent, but also other kinds of nanomaterials, such as nanocarrier (used for drug delivery), fuel cells materials and solar cells nanoparticles.



POSSIBLE INDUSTRY APPLICATION

As the only Air Resources iKohza in UTMKL, our lab is well-equipped with the facilities for air sampling, air related research and nanomaterials synthesis and characterization. The facilities are also accessible to outside organizations on a contract or collaborative basis.

POTENTIAL COLLABORATIVE AREA:

- Development of air samplers (passive, active samplers)
- Characterization and analysis of microplastics, air pollutions substance, materials (nanoparticles and nanofibers)
- Development non-thermal plasma for industrial usage
- Development of nanoparticles for the cancer treatment

Contact: Ts Dr Khairunnisa binti Mohd. Pa'ad
Email: khairunnisa.kl@utm.my