

# FLYING JET PLASMA: A LOGISTIC POWERFUL CATALYZING AGENT FOR CHEMICAL AND BIOLOGICAL PROCESSES

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**N**on-thermal plasmas (NTP), also referred to as a cold plasma, is unique tool in different applications as the temperature of electrons typically ranges from 10000 K to 250000 K while the hot gas exist in the room temperature. These highly energetic electrons produce free radicals from parent molecules in multi-step physical and chemical processes, leading to high destructive ability. NTP is currently applied in different applications such as health sectors, environmental remediation, removal of volatile organic pollutants, simultaneous removal of NO<sub>x</sub> and soot in diesel exhaust and sterilization of air and water. Plasma jets, a category of NTP which can deliver plasma up to few meters distance, are unique in producing reactive chemistry at room temperature. Therefore, it has attracted much attention in different applications due to their versatility and low-cost operation. Jet plasma with a privilege of lower shock risk, compared with DBD and corona discharges, can penetrate and propagate inside small holes and flexible dielectric tubes, which is quite useful in different applications. In this sense, we developed a flying jet plasma torch (FJPT) and used it as impetus in wide spectrum research. Those were dedicated to investigate FJPT as a sole and assisting catalyzing agent for biodiesel production from fresh and wasted vegetable oil, treatment of raw polymers (polypropylene, polystyrene, and polyethylene) before end use process, regeneration of reforming spent catalyst, and health sector (inactivate wide range of pathogens). Recent reserches were devoted to treat land fill leachate towards biodiesel production and treatment of granulated activated carbon towards simple way of carbon nano tubes production

## Biography

Wameath Abdul-Majeed, a consulting chemical engineer, received his BSc and MSc degrees in Chemical Engineering from the University of Technology, Baghdad, and his PhD from the University of Sheffield, UK. Working in the engineering sector and other industries for over 23 years has consolidated his knowledge in design, commissioning and operation of chemical plants in addition to professional knowledge of industrial management. Moreover, he has worked as a Lecturer and Assistant Professor for several years in different universities and institutes. He took up his most recent tenure, as an Assistant Professor, in the Chemical and Petrochemical Engineering Department at the University of Nizwa, Oman, in 2014, and he was appointed as a head of the department in 2016. Wameath has a considerable publication record and has served as a peer-reviewer and editorial board member for a number of indexed journals. His current research interests are focused on the application of non-thermal plasma in industrial fields, and the environmental and health sectors. His other research interests are in the hydrogen and CO<sub>2</sub> sectors.

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