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Seminar

Institute for Plasma Research

Title : Study of Plasma Activated Water and its Potential Applications

Speaker: Mr. Vikas Rathore
Institute for Plasma Research, Gandhinagar

Date : 04th March 2021 (Thursday)

Time : 11:00 AM

Venue : Online - Join the talk:

https://meet.ipr.res.in/Vikas_PAWapplications

Abstract :

Plasma activated water (PAW) gaining significant attention in past two decades due to its enormous potential in inactivation of pathogens such as bacteria, fungi, virus, and pest, etc. Further, it improves germination and plant growth, food preservation, and cancer cells inactivation, etc. These application of PAW mainly depends on its physicochemical properties such as pH, reactivity (oxidation-reduction potential), and electrical conductivity, etc.

In the present work, how the process parameters affect the reactivity of plasma activated water have been studied. The obtained results clearly shows that the flow rate of air, plasma interaction time with water, and plasma discharge power play a significant role in controlling the reactivity and electrical conductivity of PAW. Further, how the reactivity of plasma activated water changes with time is also investigated which has direct implications when it will be used commercially. The study shows that the concentration of reactive oxygen-nitrogen species varies with aging of PAW which changes the physicochemical properties of PAW. The PAW prepared in optimum condition is used to study its bactericidal and fungicidal efficacy. The results reveal that PAW inactivates a high concentration of bacterial and fungi colonies and retains this efficacy for the long term.

In our study the PAW has also shown the potential to improve the germination of seeds and plant growth. The study was conducted using *pisum sativum* (Pea) seeds to study the effect of PAW on germination and plant growth. Higher growth of plant observed after PAW treatment compared to control.

In conclusion, we can say that PAW has the potential to be used as a chemical-free alternative for various disinfection purposes (bacteria, fungi, virus, and pest, etc.). Also, it has the enormous potential to be used in the medicine, agriculture, and food sector.
