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STUDY OF PLASMA ACTIVATED WATER AND SECONDARY EFFECTS ON WATER USING GAMMA RADIATION WITH FTIR IN SEEDS GERMINATION

Plasma activated water (PAW) and gamma radiation has intensively been used in many agricultural applications which includes increasing the germination rate, promoting plant growth. However it is important to pay attention to the both effect of PAW and gamma radiation to study the detailed characteristics of chemical composition of tap water and distilled water stimulated by plasma and gamma radiation on seed germination by Fourier transform infrared spectroscopy (FTIR) technique and optical emission spectroscopy (OES). In this work, plasma and gamma radiation were utilized to prepare water for seed germination. Plasma activation and gamma radiation are treated on both tap water (TW) and distilled water (DW) with 2.5, 5.0, 7.5 and 10.0 sec. The experiment shows the chemical compound of oxygen and nitrogen species diffused through the water such as O_3 , NO_2 , NO , NO_3 , HNO_3 , HNO_2 and H_2O_2 . Plasma activation and Gamma radiation were utilized to modify both tap water and distilled water in this work. The plasma activation and gamma radiation may cause reactive oxygen and nitrogen species (RONS) which could be favorable for the germination of seeds.

Keywords: Plasma Activated Water, Air plasma, Gemination rate, Gamma radiation

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