

This concern regarding the tainting of our water supply demands the presentation of new, productive, and viable water purging technologies capable of eliminating these contaminants. To check for these pollutants, innovations and techniques that completely remove water pollution will be necessary. NTAPP discharges have recently been used to resolve this issue. Plasma reactions can occur in wastewater via two mechanisms: plasma formation in contact with the liquid surface and production directly within the liquid. In the first mechanism, the plasma interacts directly with the liquid surface at the liquid–gas interface. The chemical reactivity in plasma is evolved using the interface reactions and transport of reaction species from the gas phase to the liquid phase. The second mechanism can be implemented via the propagation of streamer discharge either within bubbles generated by external gas injection or in microbubbles produced by the field [50]. NTAPP is a source of charged particles, radicals, excited and reactive species, shockwaves, ultrasound, and UV radiation, which are not generally harmful to health or the environment. These species can significantly inactivate bacteria and destroy viral infections by degrading organic molecules. In recent years, different kinds of plasma with various reactor geometries have been studied for water treatment applications. It has been shown that a straightforward gas–phase discharge in contact with liquid water is better than breaking the discharge using submerged electrodes in the water. In 2017, Sukhwal et al. [50] designed a micro discharge plasma jet (MDPJ) with a simple geometry and low power consumption. Their discharge system consisted of a high voltage power supplier, high voltage electrode, grounded electrode, dielectric tube, and developed reactor. The authors showed that the stable production of plasma and active species such as RONS is key for water purification using an MDPJ. When a gas enters the inner electrode, the gas velocity increases due to the increasing gas flow rate, and consequently, the length of the plasma jet increases as well