

# EFFECTS OF PERSULFATE AND HYDROGEN PEROXIDE ON OXIDATION OF OXALATE BY PULSED CORONA DISCHARGE TREATMENT

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Application of gas-phase pulsed corona discharge (PCD) (Fig. 1) to oxidation of aqueous pollutants shows unequalled energy efficiency among advanced oxidation processes (AOPs) [1]. Improved AOPs often activate extrinsic oxidants [2]. Experimental research was undertaken into sodium persulfate and hydrogen peroxide activation by PCD in oxidation of 1.11 mM oxalate. Oxidant and target compound concentration ratios, pH and pulse repetition frequency were studied as control parameters. Results implicated a beneficial effect at oxalate/persulfate molar ratios from 1:0.1 to 1:1 in acidic medium with the optimum at 1:0.5, and lower frequency. However, the observed synergism of PCD/PS combination decreased with increasing the initial pH of the treated solution. Hydrogen peroxide exhibited negative or neutral impact in all studied media. Non-assisted PCD proved the most energy efficient approach towards water treatment at neutral and alkaline conditions.

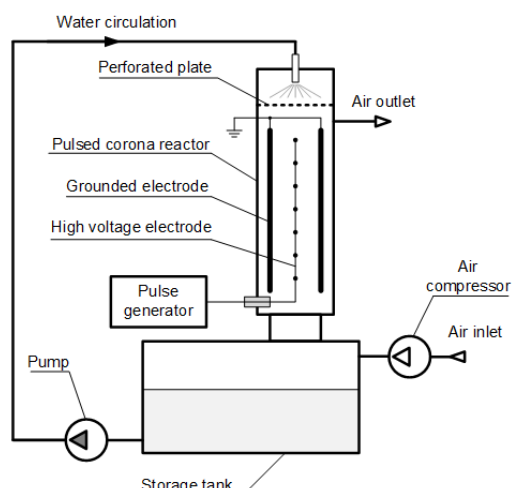


Fig. 1 Pulsed corona discharge experimental device

## References

1. S. Preis, I.C. Panorel, I. Kornev, H. Hatakka, J. Kallas, 2013, *Water Science & Technology*, 68, 1536 – 1542.
2. Guerra-Rodríguez, E. Rodríguez, D.N. Singh, J. Rodríguez-Chueca, 2018, *Water*, 10.