Abstract Submitted
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Effect of metal catalyst loading on surface ionization waves in packed bed dielectric barrier discharge[1] ZAKA-UL-ISLAM MUJAHID, Jazan University, Ruhr-University Bochum, MUKUL SHARMA, Jazan University, ABDULLAH ALFAIFI, King Khalid University, JULIAN SCHULZE, Ruhr-University Bochum, Dalian University of Technology — Metallic catalysts are often added on the surface of dielectric beads in a packed bed dielectric barrier discharge to improve the performance. The improved performance is possibly linked with the synergy between the plasma and catalyst; however, such synergy still needs to be understood fundamentally. The previous work showed that plasma is generated in a packed bed reactor due to the combination of filamentary microdischarges (F-MD) in volume, surface microdischarges (S-MD) at the contact points and surface ionization waves (SIW) over the surface [1]. In this work, we have investigated how the metal catalyst loading position on the dielectric surface affects the discharge mechanisms especially the surface ionization waves. The results showed that the metal catalyst loading can change the initial breakdown position and surface ionization waves can be enhanced or suppressed depending on the catalyst loading position. The change in discharge behavior could be linked to the enhancement of the electric field emission and change in the electric field distribution. [1] Z. Mujahid, J Kruszelnicki, A Hala and MJ Kushner, Chemical Engineering Journal, 382, p. 123038. (2020) -/a

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