

Pulse Assistant RF Discharge and Its Application on NO and SO₂ Removal

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Nitrogen oxide (NO) and Sulphur dioxide (SO₂) are the components most difficult to remove in air pollutions. As the plasma techniques, removal efficiency is determined by many factors, among which the power source is particularly important and the discharge driven by pulse assistant radio frequency (rf) source was studied in our previous work [1-5]. Then, removal of NO is investigated in capacitive atmospheric pressure discharges driven by both radio rf and trapezoidal pulse power with a one-dimensional self-consistent fluid model [6]. The results show that the number density of NO could be reduced obviously once a low duty ratio short pulse is additionally applied on the rf power. NO removal process of the pulse modulated rf discharge could be divided into three stages: the quick reaction stage, the NO removal stage, and the sustaining stage, respectively. Furthermore, the temporal evolutions of particle densities are analysed, and the key reactions in the stages are discovered. Finally, the SO₂ purification with the pulse assistant RF discharge is also investigated.

References

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