

Destruction of PFCs gas using microwave plasma operating at a low pressure

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The perfluorocompounds (PFCs) gases are used mainly in industrial processes for production of display, semiconductor, metal, and etc. The PFCs are greenhouse gases with atmospheric lifetimes of more than 1000 years. They are powerful greenhouse gases and today's emissions will still be affecting earth's climate in the next millennium. The microwave plasma operated in a low pressure chamber for destruction of PFCs gases in this study. The microwave plasma was operated in a closed and isolated environment may provide an opportunity for the mass production of chemically active radicals for various chemical and biological processes. The operation at a low pressure of microwave plasma would be economical cost of capital, maintenance, and operational compared to other plasma devices. The electric field induced in a quartz discharge tube by microwave radiation break down the gas at a sufficiently low pressure, igniting the plasma, which is continuously sustained by the microwave radiation. The plasma profile at a low pressure was asymmetric with higher density on the incoming side of the microwaves. This behavior of the plasma inhibits high-power operation of microwave plasma at a low pressure. However, the asymmetry of the plasma profile disappears under a high gas flow rate. Destruction of PFCs gas indicates that the microwave plasma used at a low pressure can efficiently produce an abundance of chemical radicals.

REFERENCES:

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