Octiv VI Probe in Atmospheric Plasma Applications

RF Measurement and Plasma Control Sensors

https://impedans.com/octiv-mono-rf-wattmeter

https://impedans.com/octiv-poly-vi-probe

https://impedans.com/octiv-suite-vi-probe

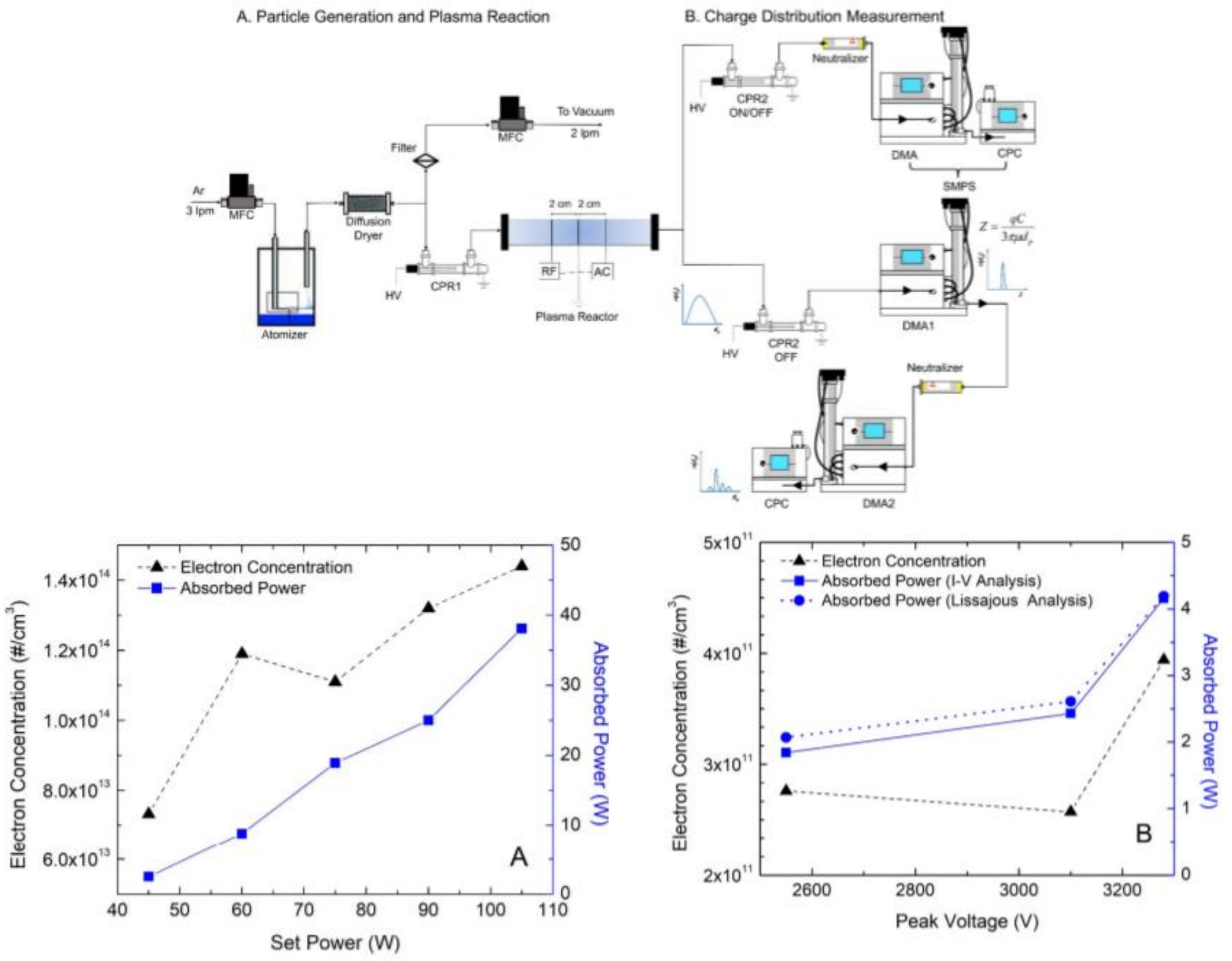
Electrical characterization of the RF plasma using Octiv Poly probe

Characterization of Particle Charging In Low-temperature, Atmospheric-Pressure, Flow-through Plasmas

DOI: https://doi.org/10.1088/1361-6463/ab7c97

In this work, particle charging was systematically characterized for low temperature, atmospheric-pressure, flow-through plasmas with AC and RF power couplings. Aerosolized nanoparticles were produced using an atomizer (TSI Aerosol Generator Model 3076) with argon (Ar) as the carrier gas. For the AC plasma, the absorbed power was calculated using both Current–Voltage measurements (using Octiv Poly) and Lissajous analysis, which were found to agree very well.

Some example data is shown to the right.



Experimental setup and Electron density, absorbed power, and electron temperature in (A) RF and (B) AC plasmas as a function of power and applied peak-to-peak voltage, respectively.

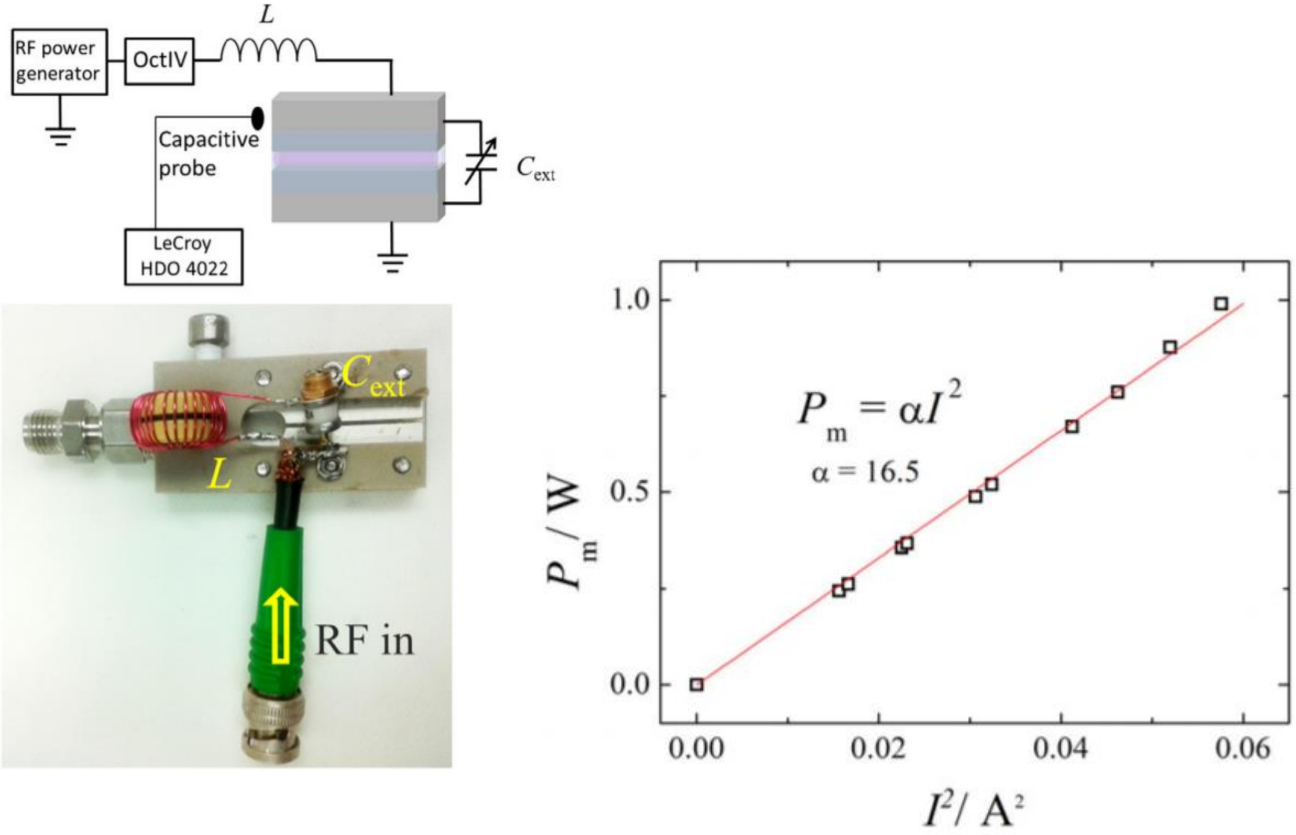
Demonstration of a compact and efficient RF coupling circuit for the µAPPJ

Power coupling and electrical characterization of a radio-frequency micro atmospheric pressure plasma jet

DOI: http://dx.doi.org/10.1088/0963-0252/23/6/062005

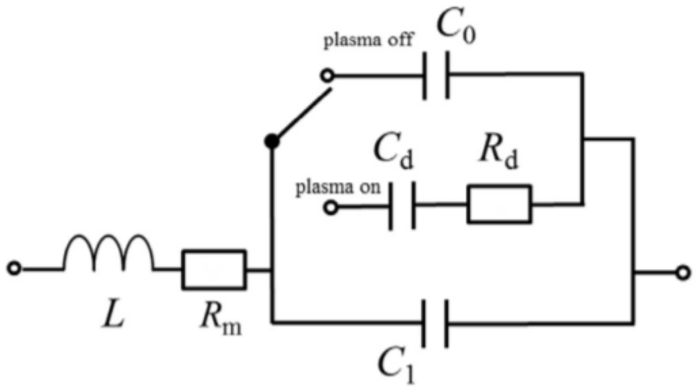
In this work, an efficient RF power coupling scheme is proposed for a micro atmospheric pressure plasma jet operating in helium. The discharge gap is used as a resonant element in a series LC circuit. Systematic measurements of the dissipated power as a function of the applied voltage are reported for the discharge operating in helium with molecular admixtures of N_2 and O_2.

Some example data is shown to the right.

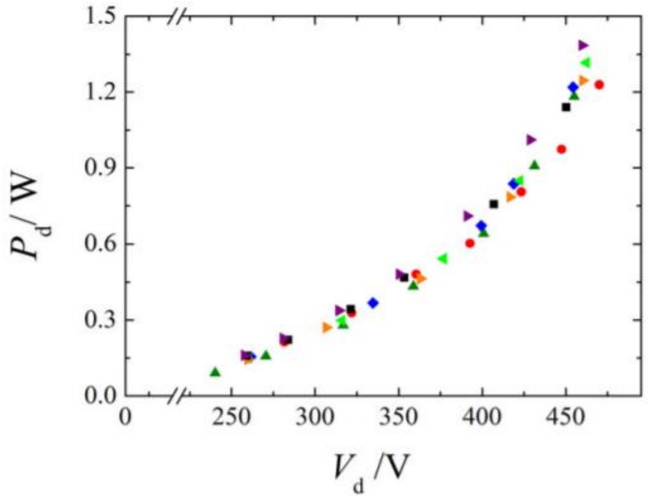


Experimental setup and power dissipated in the coupler versus input rms current squared.

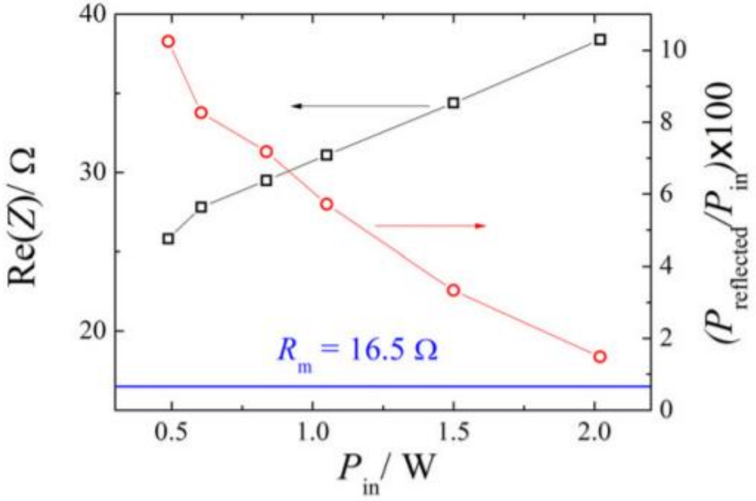
Demonstration of a compact and efficient RF coupling circuit for the µAPPJ



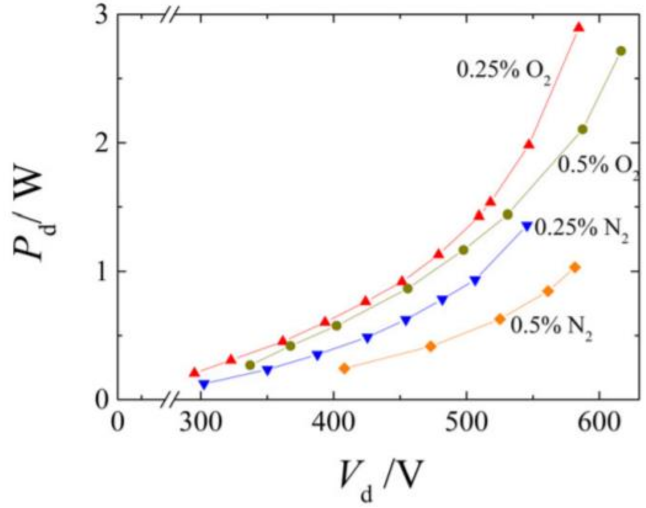
Equivalent electrical circuit of the device with plasma on and plasma off.



Discharge power in He as a function of the voltage amplitude. Different symbols correspond to different experimental runs indicating the reproducibility of the measurements.

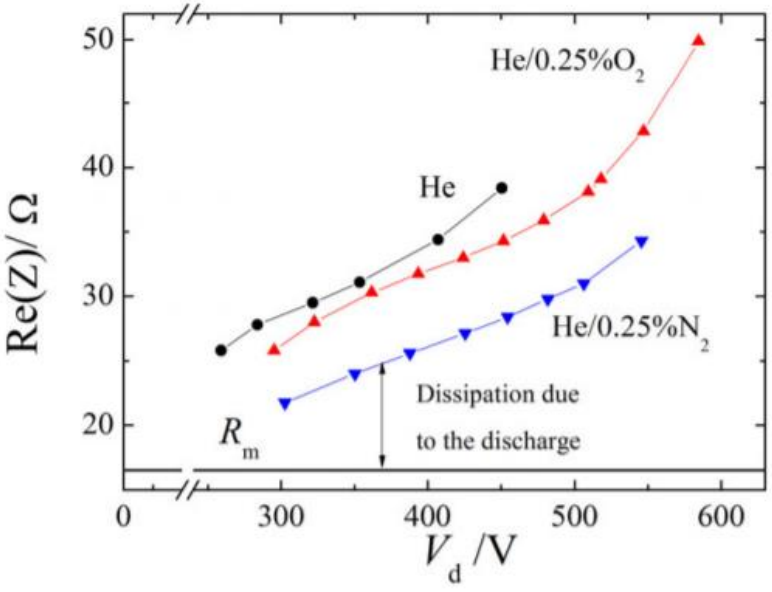


Real part of the total device impedance with He plasma () and fraction of the power reflected (◦) as a function of the incident RF power.

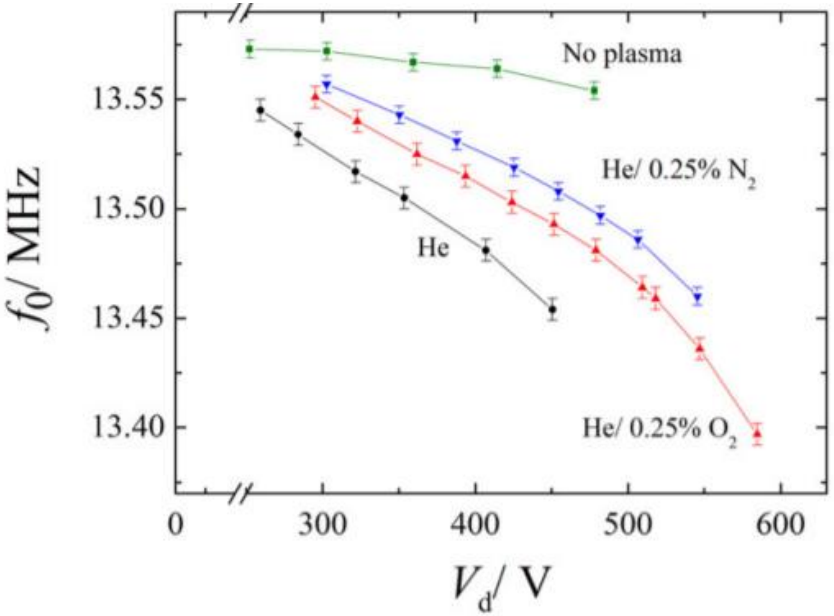


The discharge power versus discharge voltage amplitude in He with O_2 and N_2 admixtures.

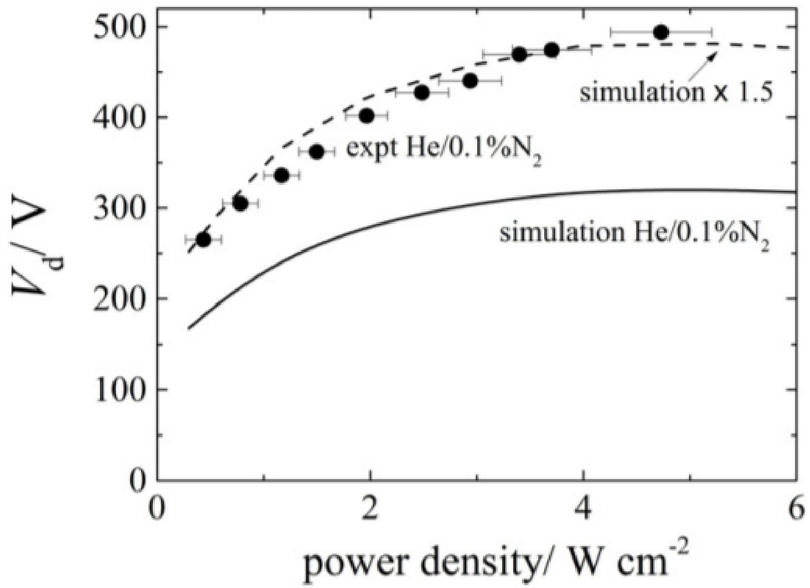
Demonstration of a compact and efficient RF coupling circuit for the µAPPJ



The real part of the total circuit impedance with plasma on versus discharge voltage.



The resonance frequency versus discharge voltage measured with plasma off and plasma on in pure He , He/0.25% O_2 and He/0.25% N_2.



The discharge voltage amplitude versus discharge power density.

Impedans PLASMA MEASUREMENT

Controlled injection of near-isolated liquid microdroplets into a low-temperature atmospheric pressure plasma

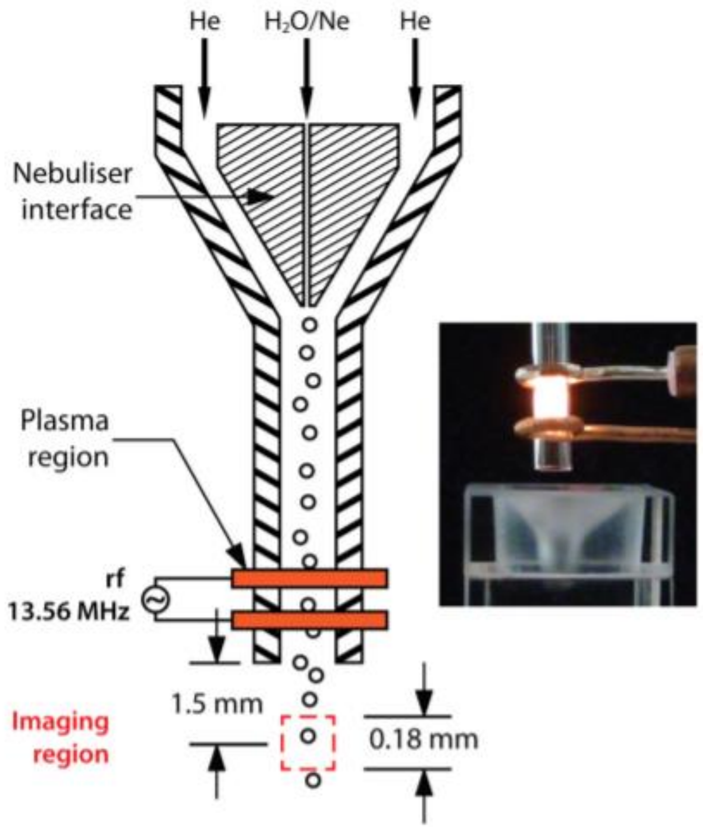
Controlled micro-droplet transport in an atmospheric pressure micro-plasma

DOI: http://dx.doi.org/10.1063/1.4922034

This work presents the controlled injection of near-isolated micron-sized liquid droplets into a low temperature He-Ne steady-state rf plasma at atmospheric pressure.

An Impedans Octiv IV probe was used to measure the RF current, voltage, and phase on the incoming RF power line for a range of helium and neon flow rates.

Some example data is shown to the right.



Schematic of plasma setup consisting of ring electrodes around 2 mm diameter quartz tube and nebuliser interface.

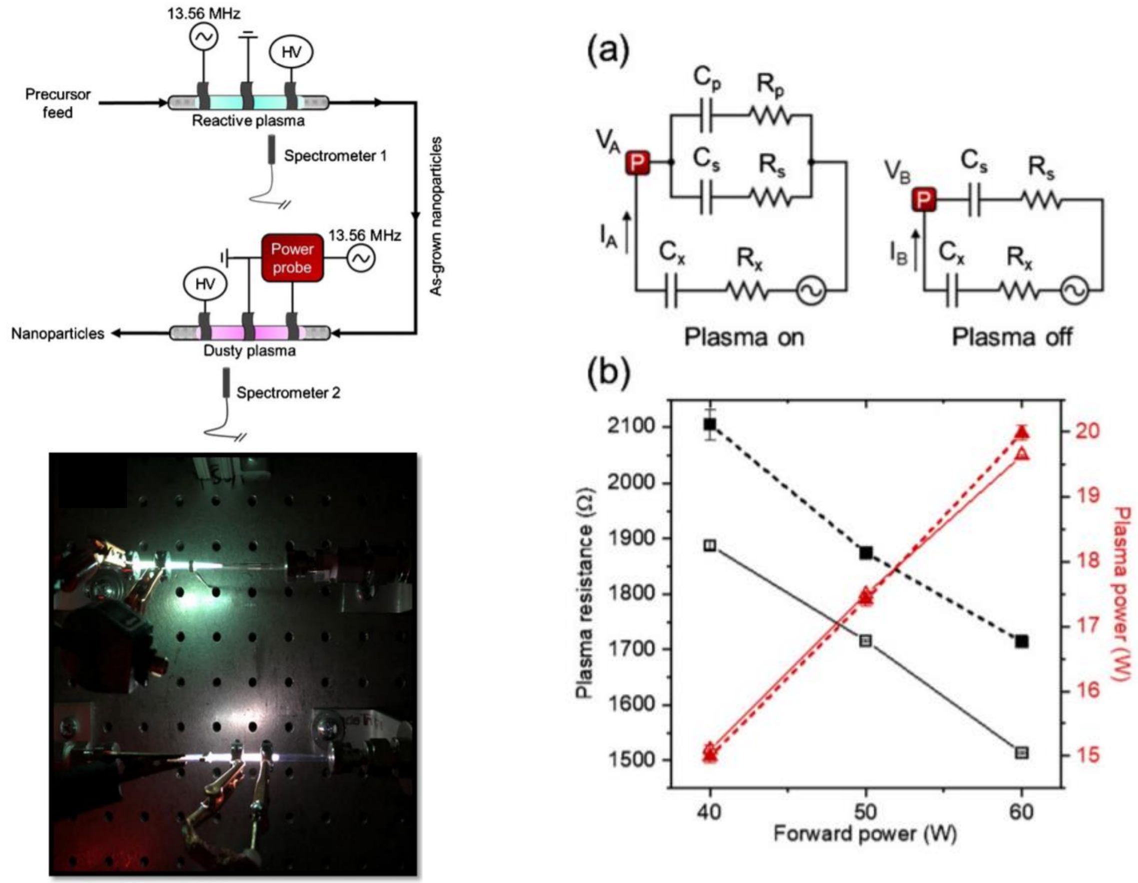
Effect of the NPs on a typical type of continuous-flow, substrate-free plasma at atmospheric pressure

Understanding the depletion of electrons in dusty plasmas at atmospheric pressure

DOI: https://doi.org/10.1088/1361-6595/ab9cc3

This work presents a fundamental study of plasma particle interactions at atmospheric pressure. Authors designed a flow-through, tandem system consisting of two identical atmospheric-pressure plasmas of the type that have been previously used to synthesize NPs by gas-phase nucleation.

Some example data is shown to the right.



Schematic diagram of tandem atmospheric-pressure plasma system.
(a) Equivalent circuit diagrams of the dusty plasma reactor for 'plasma on' and 'plasma off' cases. p = plasma, s = stray, and x = transmission. V_A and I_A are the voltage and current for the plasma on case; V_B and I_B are for the plasma off case.
(b) Plasma resistances (squares) and plasma powers (triangles) as a function of forward power

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Impedans PLASMA MEASUREMENT