Front Cover: A new gas phase plasma method for synthesis of gold nanoparticle (AuNPs) via non-thermal radio frequency (RF) plasma is presented and compared to a vacuum hot-wire technique. The plasma method leads to AuNPs with narrow size distribution and small average size, and points to the potential of RF plasmas for metal nanoparticle synthesis.

Further details can be found in the article by Alborz Izadi and Rebecca J. Anthony (e1800212).

A radiofrequency plasma method is used for the synthesis of gold nanoparticles (AuNPs) with narrow size distribution and the average size of 4 nm. The AuNPs are analyzed using transmission electron microscopy imaging, and the method is compared to a hot-wire technique. Although the mass yield is low, this method is promising as a gas-phase, surfactant-free method of AuNP synthesis.

Plasma-liquid interactions have attracted many attentions, one of which focus on the plasma processes and reaction pathways. This paper aims to present the mutual effects of short-lived radicals on the generation of long-lived species, and the transport processes of reactive species from gas phase to liquid phase in a nanosecond pulse excited bubble discharge.

Measurement of reactive species in different solutions of bubble discharge with varying O₂/N₂ proportion in Ar: Analysis of reaction pathways


A plasma-based gas-phase method for synthesis of gold nanoparticles

A. Izadi, R.J. Anthony

**The role of oxygen on the growth of palladium clusters synthesized by gas aggregation source**

W. Chamorro-Coral, A. Cuillard, P. Brault, P. Andreazza, C. Coutanceau, S. Baranton


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**Quantitative spectrochemical analysis of solution plasma in aromatic molecules**

M.A. Bratescu, K. Kim, N. Saito


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**Atmospheric pressure air plasma treatment to improve the 3D printing of polyoxymethylene**

I. Muro-Fraguas, E. Sainz-García, A. Pernía-Espinoza, F. Alba-Elias


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**Characterization of the deposition behavior and changes in bonding structures of hexamethyldisiloxane and decamethylcyclopentasiloxane atmospheric plasma-deposited films**

M.A. Gilliam, S.A. Farhat, G.E. Garner, B.P. Stubbs, B.B. Peterson


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**Palladium clusters obtained with a gas aggregation source.** In our study, oxygen was used to promote the cluster production; however, the cluster composition has changes.

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**In solution plasma in three aromatic molecules: benzene, pyridine, and aniline, a quantitative spectrochemical analysis unveil the molecules and radicals from the plasma gas and newly formed compounds into the solution.** Electron spin resonance and gas chromatography confirm the spectrochemical analysis. The production rate of the carbon material correlates to plasma gas composition.

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**The use of polyoxymethylene as three-dimensional printing material opens a completely new path for material processing due to its excellent properties. However, the adhesion of the first-printed layer is a problem. In this way, an atmospheric pressure air plasma treatment applied over a polycarbonate (PC) printing base increases the adhesion of up to 45% with respect to the untreated PC.**

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**Deposition characterization of two organosilicon precursors in atmospheric plasma reveals the energy-deficient and monomer-deficient domains. Changes in Si–O–Si bonding structures are observed using Fourier-transform infrared spectroscopy and correlate to the energy domains. Cross-linked network structures are more abundant in the energy-deficient domain, while more porous cage structures are formed in the monomer-deficient domain.**