FOR IMMEDIATE RELEASE

RASIRC Presents Low Temperature Silicon Nitride ALD at Annual ALD Conference
Chief Technology Officer moderates ALD Fundamental Process and Precursor Session

San Diego, Calif – July 27, 2018–RASIRC will present the latest research findings on both hydrogen peroxide gas and hydrazine gas at the annual ALD Conference held July 29-August 1, 2018 in Incheon, South Korea. RASIRC Chief Technology Officer Daniel Alvarez will present the latest on Area Selective Deposition (ASD) using anhydrous hydrogen peroxide. He will also present a poster on a study of silicon nitride deposition that yielded highly uniform films at process temperatures below 400°C. Alvarez is a session moderator for *ALD Fundamentals Processes and Precursors I* on Monday afternoon.

"Interest in novel processes and precursors continues to increase as manufacturers work to overcome compressed thermal budgets and increased wafer surface complexity," said Jeffrey Spiegelman, RASIRC President and Founder. "Research shows that for low temperature ASD and ALD highly reactive gases like anhydrous hydrazine and hydrogen peroxide are compelling solutions."

Technical Presentations and Posters

Alvarez is co-moderator for Session **AF1-MoA** *ALD Fundamentals: Precursor and Process I*, 1:30-4:00 on Monday July 30, Room 107-109.

Alvarez and Spiegelman are contributing authors to the following presentations and posters:

"*Surface Preparation and High Nucleation for Selective Deposition using Anhydrous Hydrogen Peroxide*," 2:00 Tuesday July 31, Room 113-115 – **AS-TuA3**
D. Alvarez, J. Spiegelman, K. Andachi, RASIRC

"*Investigation of Low Temperature Silicon Nitride Deposition using Hexachlorodisilane and Ultra-High Purity Hydrazine*," Tuesday Evening Poster Session, July 31 – AF-TuP36
A. Lucero, A. Kondusamy, S.M. Hwang, X. Meng, H. Kim, J. Kim, University of Texas at Dallas, D. Alvarez, J. Spiegelman, RASIRC;

"*High Purity Hydrazine Delivery System for Low Temperature Thermal ALD of Silicon Nitride*," Tuesday Evening Poster Session, July 31 – **AM-TuP2**
J. Spiegelman, Daniel Alvarez, K. Andachi, RASIRC; A. Lucero, A. Kondusamy, S.M. Hwang, X. Meng, H. Kim, J. Kim, University of Texas at Dallas

BRUTE Hydrazine for Low Temperature Nitride ALD

Recent tests demonstrated high purity hydrazine delivery at <800ppb water contamination in the gas phase. SiN films with low impurities were achieved at 320-400C. Highly uniform films were obtained across a 4 inch wafer for 200 as well as 400 cycles. The poster compares film density and wet etch rate results at different temperatures for hydrogen terminated silicon, hydroxyl terminated silicon, and hydrazine treated silicon.

BRUTE® Hydrazine enables low temperature ALD (sub-350°C) and low resistivity. BRUTE Hydrazine gas is virtually water free and has a relatively high flash point for safer handling. Highly reactive, BRUTE Hydrazine creates uniform nitride deposition for advanced materials.

BRUTE Chemistry for Surface Functionalization and Selective Deposition

Creative surface blocking agents are being used in efforts exploring novel methods for Area Selective Deposition (ASD). These agents include self-assembled monolayers, patterned photoresists, plasma deposited films and others. At the same time, high nucleation and growth of metal oxide films require creation of reactive surfaces.

Hydrogen Peroxide is an attractive chemistry for area selective deposition because of both its oxidation properties and proton transfer properties. The chemistry compares favorably to Ozone and has slightly stronger proton transfer than water. Most critically, H2O2 has a very weak O-O bond, suggesting high speed, high density results.

BRUTE Peroxide is a novel oxidant that improves passivation and nucleation density at semiconductor interfaces when compared to water. Surface functionalization is denser and initiation is faster using this anhydrous hydrogen peroxide gas compared with alternatives.

Exhibit Booth

Conference attendees are invited to visit RASIRC at the Exhibition Area. Representatives will be available to answer any questions and discuss the latest research on BRUTE Peroxide and BRUTE Hydrazine. Also learn about the Peroxidizer® for high-volume ALD and the RainMaker Humidification Systems (RHS) for select ASD and VCSEL applications.

Product Availability

BRUTE Hydrazine is available in 250g and 750g replaceable units. BRUTE Peroxide is available in 300g and 900g replaceable units. Both BRUTE chemistries are also available in a compact Laboratory edition is also available for use under vacuum draw. This plug-and-play version enables universities, research institutes and advanced technology groups to work with the smaller amounts of chemistry for rapid thin film process screening.

The Peroxidizer® delivers hydrogen peroxide gas in stable, high concentrations from 12,500 to 50,000 ppm, which equates to 1.25 to 5% gas by volume. The system handles gas flows of 5 to 30 slm in vacuum or atmospheric conditions. The RainMaker® Humidification System (RHS) provides precision control of water vapor at a wide range of flow rates.

About RASIRC

RASIRC specializes in products that generate and deliver gas to fabrication processes. Each unit is a dynamic gas plant in a box—converting common liquid chemistries into safer and reliable gas flow for most processes. First to generate ultra-high purity (UHP) steam from de-ionized water, RASIRC technology can now also deliver hydrogen peroxide gas and hydrazine gas in controlled, repeatable concentrations. RASIRC gas delivery systems, humidifiers, and closed loop humidification systems are critical for many applications in semiconductor, photovoltaic, pharmaceutical, medical, biological, fuel cell, and power industries. Call 858-259-1220, email info@rasirc.com or visit http://www.rasirc.com.

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Contacts:

RASIRC

Jeffrey Spiegelman

Phone: 858-259-1220

E-mail: jeff@rasirc.com