

## **Robert Dopp**

**Keywords:** Water Electrolysis, Battery, Gas Electrode and Zinc Air Expert

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### **BIOGRAPHY:**

Mr. Dopp is one of the foremost authorities on water electrolysis for hydrogen generation, zinc-air fuel cells & air electrode technologies with 50 related patents (issued and applied for) bearing his name. During his 25 year career in the battery industry he grew from a senior engineer to director level responsibility in Zinc Air development.

Forming his own R&D consulting firm and laboratory in 2002, DoppStein Enterprises Inc. (DSE), he consults to battery, fuel cell, and hydrogen generation related industries with his significant expertise in a wide range and depth of knowledge in battery, fuel cell, and hydrogen generation systems. His onsite laboratory in Marietta, Georgia provides him considerable flexibility, consulting on the electrochemistry and design of gas electrodes, building cathode machines and very high rate electrolysis apparatus' among other development projects.

As chief scientist and CEO of DSE, Mr. Dopp is working in renewable energy related fields including electrodes for batteries, metal-air fuel cells and hydrogen production through water electrolysis. Mr. Dopp has been a guest lecturer on university campuses and at technical associations including the National Hydrogen Association and Sandia National Laboratories.

### **Meeting your needs at DoppStein Laboratory**

#### **DSE Capabilities**

- Develop hydrogen and oxygen generation cells from laboratory-made electrodes.
- Develop gas electrodes specific for your needs. Current nano Nickel/Cobalt catalysts are proving to be nearly as active as Platinum for oxygen reduction at a fraction of the cost.
- Develop battery and fuel cells from custom-made cathodes.
- Electrochemical testing and evaluation of gas electrodes produced elsewhere for functionality and failure analysis. Testing would include electrochemical and impedance spectrographic analysis. Evaluation and recommendations would follow thorough testing.
- Creative approaches to client needs.
- Skilled at cell manufacturing line design & troubleshooting.
- Cell optimization studies and Cell failure analysis including internal and reference electrode work.
- Creative electronic circuit designer and builder. Have created many test and application circuits.
- Government contract experience (e.g.: CECOM, SBIR grants)
- Work closely with patent attorneys and Patent Office. Substantial patent portfolio.
- Mentor of young scientists and engineers to learn how to expand their horizons of thought.

### **Water Electrolysis Equipment:**

Many test reactors have been made both in the half-cell and whole cell design to optimize hydrogen (and oxygen) production in alkaline electrolytes. Flat plate designs are running at high efficiencies in creative assemblies for robust performance in many applications. Devices using a patent pending Electrochemical Fluidized Bed design are running at energy efficiencies above 85% at 5 Amps/cm<sup>2</sup>.

### **WORK EXPERIENCE:**

#### **2002 - Present**

**Formed Consulting Firm, DoppStein Enterprises** and as CEO and chief scientist, his research has centered on Hydrogen generation from water electrolysis, Fuel cells, Air-breathing batteries. Since founding 6 year ago, 14 patents have been filed assigned to three clients (as of 2008). Clients and activities have included: A major battery company (new electrodes and failure analysis), Catalyst making corporation (verification of their catalyst, electrolysis methods), Research & Development (new proton-permeable electrode for a thermal battery), small battery company (failure analysis and solution suggestions), major R&D company (line evaluation and suggesting improvements), two National Laboratory projects and Mentoring of young scientists.

#### **1997 – 2002**

##### **Electric Fuel Corporation of Biet Shemesh Israel.**

Director of Research - New Products, Manager of Marietta GA Laboratory

Directed research from his Marietta GA zinc air research laboratory. Designed and developed the gas-electrode manufacturing machinery and many other components for Zinc Air batteries. Electrochemical studies for failure analysis and product improvement. Vendor qualification.

#### **1979 – 1997**

##### **Rayovac Corporation, Madison, WI.**

Principal Engineer, Micro-power Division, Zinc Air Development

A major contributor to the development of the Zinc Air product line. Managed an eight person Zinc Air R&D team and co-managed 18 engineers and technicians with labor value of \$50.7 Million. Has 34 patents in Zinc Air related areas through Rayovac. Major inventor of Air cathode design and manufacturing machines. Leadership rolls in Electrochemical Society and numerous invitations as visiting lecturer.

#### **1974-1979**

##### **Upjohn Corp. North Haven, CT.**

Project Engineer in the D. S. Gilmore Fire & Flammability Research Laboratory

Studied the physics of fire. Patent for HCN detector system.

### **ORGANIZATIONS**

Electrochemical Society (ECS) since 1980, have held offices including Local Section offices, National Ways & Means Committee, Council of Local Sections and Local Section Rep. to the Board of Directors.

### **PUBLICATIONS**

Webinar: Advanced Materials for Clean Energy Applications Oct 24 2007

R. B. Dopp, "Highly Efficient Hydrogen Generation via Water Electrolysis Using Nanometal Electrodes", 9/15/06 (NHA Paper)

R. B. Dopp, "High Performance Air Electrodes with Low to Zero Platinum Catalyst Loading via Replacement with Nickel/Cobalt Nanoparticles", 9/16/05

"Hydrogen Generation Via Water Electrolysis Using Highly Efficient Nanometal Electrodes" - April 2007

Seminar: Sandia National Laboratories May 2007, "Water Electrolysis using nano Metal Electrodes" April 07

R. B. Dopp, "A Perspective on Batteries for High Power Hearing Instruments", The Hearing Review, June 1996, Vol, 3, No, 6, pp. 42, 45.

Sid Megahed & R. B. Dopp, "Batteries for Present and Future Hearing Aids", ASHA, Jn/Jly 1990, pp. 52.

**EDUCATION:** BS in Biology - University of Wisconsin - Stevens Point WI; 1968

Continuing Education with additional study at Case Western Reserve University, University of Michigan at Ann Arbor, and UW-Madison. Guest lecturer at UW-Madison.