

B. Frank Gupton, Ph.D.

Floyd D. Gottwald Jr. Chair and chair, Department of Chemical and Life Science Engineering at VCU College of Engineering

Engineering West Hall, Room 403A, Richmond, VA, US

Professor Gupton's research is focused on the development of new technologies that will streamline organic synthesis

Biography

The Gupton research group is focused on the development and application of new technologies that will streamline organic synthesis through process intensification. The goal of process intensification is to increase the overall efficiency and selectivity of chemical reactions by using novel chemistry and/ or running reactions under more extreme process conditions (temperature and pressure). We are interested in applying these principals towards the development of new catalyst systems that can be used in concert with continuous chemical processing (flow reactor technology) to streamline the synthesis of pharmaceutical active ingredients (API's).

We have developed a series of palladium catalyst systems that can be used in cross-coupling reactions for batch and continuous operations and we are currently using these catalysts in the preparation of several API target molecules. These catalysts are composed of metal nanoparticles supported on novel carbon-based platforms such as graphene or carbon nanotubes. Our group has direct access to a wide variety of surface characterization methodologies to characterize these materials which have provided fundamental insights into their unusual catalytic activity.

We are also actively involved in the evaluation and integration of continuous analytical methodologies with continuous chemical processing in order to provide real time feedback and optimization of our processes.

Industry Expertise

Education/Learning, Research

Areas of Expertise

Cross-Coupling Catalysis, Flow Chemistry / Continual Chemical Processing, Organic Synthesis in Pharmaceutical Applications

Affiliations

American Chemical Society Organic Division : Member, Flow Chemistry Society : Member, American Institute of Chemical Engineers : Member

Event Appearances

Streamlining Pharmaceutical Processes,
University of Richmond,

The Medicines for All Initiative
SelectBio Flow Chemistry Congress

A New Approach in Pharmaceutical Process Development
Virginia Polytechnic Institute and State University

A New Low Cost Approach for the Production of AIDS Drugs
University of Mainz

The Medicines for All Initiative
CPAC Annual Meeting

Education

Virginia Commonwealth University
Ph.D. Chemistry

Georgia Institute of Technology
M.S. Biochemistry

University of Richmond
B.S. Chemistry

Accomplishments

Lifetime Achievement Award, Richmond Joint Engineers Council
2015

American Chemical Society Award for Industrial Innovation
2001

Hoechst Schultheis Fellow
1991

Merle E. Kise Award for Excellence in Industrial Research
1989, 1990

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