



## **SUBBARAYAPPA ADIMURTHY**

CSIR-Central Salt and Marine Chemicals Research Institute  
India

### **Bromide-Bromate couple as an Environment-Friendly brominating reagent for diverse applications**

#### **Abstract:**

Organo-bromo derivatives have wide utility both as products and intermediates. Liquid bromine is used both for addition reactions as well as for substitution reactions. Liquid bromine is volatile and highly corrosive. Activated aromatic compounds, such as phenols, anilines, and aromatic ethers, can be brominated without a catalyst, even at relatively low temperatures, whereas other substrates may demand use of a catalyst. Liquid bromine use and its transport and handling pose difficulties. Moreover, substitution reactions with liquid bromine lead to only 50% bromine atom efficiency, although the HBr by-product can be recycled with oxidizing agents such as H<sub>2</sub>O<sub>2</sub>. Use of liquid bromine for bromination reaction is still very common in industry as well as in academia in spite of its hazardous effects probably due to lack of a suitable alternative.

To overcome these difficulties of handling and usage of liquid bromine, we at CSIR-CSMCRI developed a novel reagent alternate to liquid bromine called Green Bromine. This brominating reagent has several advantages over liquid bromine. This reagent was prepared directly from the alkaline bromine intermediate obtained from the conventional bromine recovery process, which consists of bromide-bromate salts with varying molar ratios. The bromide-bromate couple is more interesting as it bypasses bromine production when the reagent is synthesized directly from the intermediate of liquid bromine manufacture. This intermediate may be suitably designed for three types of reactions; bromination by addition (across olefins), substitution (both aromatics & hetero aromatics) and oxidation (alcohols to carbonyls) reactions by the controlled addition of suitable oxidants and reactions performed under aqueous acidic conditions.

#### **Biography**

**S. Adimurthy** received his Ph.D. degree in 2005 from Bhavnagar University, India. Currently, he is working as a Chief Scientist at the CSIR-CSMCRI, Bhavnagar, India. He did his postdoctoral position at the University of Hohenheim, Stuttgart, Germany (2007-2008) and 2015 at RWTH Aachen University, Germany. He has published over 115 papers, authored a book and holds 6 international and 12 national patents to his credit. He has 25 years of research experience and awarded 15 Ph. D's. His research interest includes, eco-friendly halogenation, synthesis of bioactive heterocycles through C-H activation and new method developments.