



Non-Confidential Description

Modified Biocide (Triclosan) with Water-Soluble Characteristics

Technology Case: RFT-207

Invention Summary

Scientists at North Dakota State University have invented a modified version of Triclosan (TCS) - Epoxy-Triclosan (ETCS) that is water soluble and has very different solubility characteristics than TCS.

While TCS is known to have restricted utility due to its limited solubility characteristics, this water soluble Epoxy-Triclosan maintains the same broad range biocidal activity as TCS and yet has solubility properties that enables it to be amenable to a wider range of applications, particularly in formulations used in cosmetics, creams and personal hygiene products.

Benefits

- Water-soluble properties permits preparing broader range of formulations
- Drives the cost for making such water-soluble formulations lower
- Maintains a broad range anti-microbial and biocidal activity

Invention Premise

Antimicrobial materials and biocides are compounds that kill or prevent the growth of pathogenic and unwanted microorganisms. 2,4,4'-trichloro-2'-hydroxydiphenyl ether, typically referred to as triclosan (TCS), is a broad-spectrum antimicrobial agent commonly used in personal care products. TCS has been formulated into hand soaps, surgical scrubs, shower gels, underarm deodorants, toothpastes, hand lotions, and mouthwashes; incorporated into fabrics and plastics such as children's toys, surgical drapes, cutting boards and toothbrush handles; and even infused into concrete for floors. Extensive investigations have been done on the toxicity of TCS and it has been found to be nontoxic orally as well as showing no mutagenic, carcinogenic, or teratogenic properties.

TCS is a crystalline powder that has very low solubility in water and other polar media commonly used as the major component of a formulated material. This property of TCS has limited the utility of the biocide for some applications. This invention involves the modification of the structure of TCS such that the product is amorphous and possesses very different solubility characteristics while maintaining its biocidal activity.

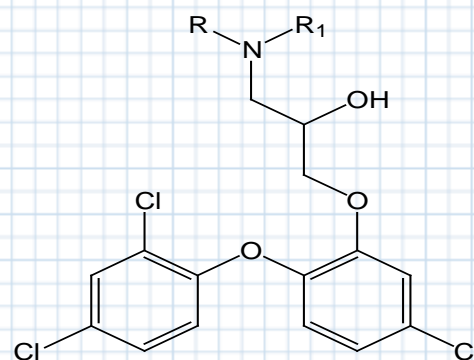


Fig. Compounds having the general structure shown below that exhibit biocidal activity

R = H, alkyl, aryl, oligomer, or polymer

R₁ = H, alkyl, aryl, oligomer, or polymer

Patents

This technology is patent pending with fully preserved U.S. patent rights available for licensing/partnering opportunities.

The Lead Inventor



Bret Chisholm, Ph.D.

Senior Research Scientist

Dr. Bret Chisholm received his B.S. degree in Chemistry from North Dakota State University in 1989 and his Ph.D. in Polymer Science in 1993 from the University of Southern Mississippi. After graduation, Chisholm was employed by General Electric (GE) for 11 years and worked in the areas of organic coatings, combinatorial/high-throughput methods, hybrid organic-inorganic coatings, polymer blends, crystalline polymers, and ionomers. In October of 2004, Chisholm joined the Center for Nanoscale Science and Engineering as a Senior Research Scientist and Director of the Combinatorial Materials Research Laboratory. He is also an Adjunct Professor for the Department of Coatings and Polymeric Materials and serves as a thesis advisor for several graduate students. Chisholm holds 20 U.S. patents and has authored more than 100 publications.

Inquiries

Jonathan Tolstedt, Licensing Associate/Patent Agent
NDSU Research Foundation, Fargo, ND 58108-6050
Phone: 701-231-8173 Fax: 701-231-6661
Email: jtolstedt@ndsurf.org
Web: www.ndsuresearchfoundation.org