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CONTINUOUS GENERATION OF ANHYDROUS *tert*-BUTYL HYDROPEROXIDE AND ITS APPLICATION IN FLOW OXIDATION

Bryan Li
Pfizer Worldwide Research and Development, USA

Anhydrous *tert*-Butyl hydroperoxide (TBHP) is a powerful oxidizing agent in many chemical transformations. Despite the versatility in organic reactions, the use of anhydrous TBHP has been greatly limited due to safety concerns of its shipping, handling, and storage and particularly on the production scale. Herein, we describe a membrane pervaporation method that allows the production of anhydrous TBHP solution in continuous manner. The system consists of membrane modules in series those are made of perfluorinated polymer with very high gas permeability allowing it to remove water efficiently. The pervaporation skid has been successfully implemented in the production by continuously generating anhydrous 1.5 M TBHP solution in nonane up to 100 mL/min for more than 96 hours achieving the target of 0.15 wt% of water. An integrated continuous flow oxidation of a γ-butyrolactam produces 100+ kg of a pharmaceutical intermediate.

BIOGRAPHY

Bryan Li is currently a Research Fellow in the Chemical R & D of Pharmaceutical Science Small Molecule division, Pfizer Inc., Groton, Connecticut, USA. He received his BSc. from Eastern University of Science & Technology, Shanghai, China in 1986, and PhD. in 1993 from University of Rhode Island, USA under the guidance of Prof. Elie Abushanab. Subsequently, he worked in Prof. Gary Posner's group at the Johns Hopkins University at Baltimore, Maryland as a postdoctoral fellow for two years. In 1998, he joined Pfizer as a process chemist, and serves as a program lead responsible for exploratory development of drug candidates. In addition, Li has been leading and driving the development and implementation of continuous flow processes in the production in Pfizer.

Bryan.li@pfizer.com