2011首届中国大连低碳地球峰会暨
BIT’s 1st World Congress of Environmental Biotechnology - 2011
第一届国际环境生物技术大会
主题：健康 安全 环境 友好
Theme: Healthier Safer and Environment Friendly

时间: 2011年10月19-22日
Time: October 19-22, 2011

地点: 中国大连世界博览广场
Venue: Dalian World EXPO Center, China

主办单位
Hosting Organizations

国家外国专家局国外人才信息研究中心
Information Research Center of International Talent, China
State Administration of Foreign Experts Affairs

中国国际贸易促进委员会大连市分会
China Council for the Promotion of International Trade
Dalian Sub-Council

承办单位
Operating Organization

百奥泰国际会议（大连）有限公司
China World Congress (Dalian) Inc.

www.bitconferences.com/wceb2011/
Title: Bio-based Dental Restorative Material to Replace Mercury Amalgam

Dr. Seng Neon Gan, Noor Haryaty Abd Kasim, and F. A. Sanabani
Professor
University of Malaya
Malaysia

Abstract

Replacing toxic mercuric amalgam with safer materials, Mercury amalgam has been one of the oldest dental materials which had been used widely for filling tooth cavities. It was relatively low cost, easy to apply, and quite durable. Studies had seen that people with amalgam fillings were found to have higher concentrations of mercury in various body tissues including blood, urine, kidney and brain compared to those without. The popularity of dental amalgam has been declining due to its poor aesthetic value, beside the worry of mercuric poisoning. In some countries such as Japan, Norway, Denmark and Sweden the use of amalgam dental filling has been banned. In recent years many alternative materials for dental restoration have been developed. These materials include composites, glass ionomers and resin modified glass ionomer cements. This paper describes how we have created a new biocomposite resin from palm oil-derivatives to be used as dental restorative material which could replace mercury amalgam. Low molecular weight polyester polyols were first synthesized from palm oil derivatives. The polyols were then reacted with excess diisocyanate to form oligomers with isocyanate terminals. Subsequent addition of hydroxyl acrylic compounds would lead to the grafting of the acrylic onto the oligomers to form resins that contain –C=C- terminals. These resins could be readily cured by free radicals, activated by light. The final resins could be made into dental restorative materials for filling dental cavities. The performances of the bio-based materials were comparable to other commercial dental resins made from petroleum-based chemicals. The use of more natural materials would greatly reduce the toxicity problems, besides it would greatly reduce the cost and make dental restoration more affordable to everyone.

Biography

Seng Neon Gan, male, polymer chemist, graduated with B.Sc.Hons from the Chemistry Department, University of Malaya in 1973. He obtained Ph.D. from the same university in 1976, and went to the Centre des Recherches sur les Macromolecules in Strasbourg, France, for post-doctorate training. He returned to serve the University of Malaya in 1978 at the Centre of Foundation Studies, teaching preparatory chemistry courses to selected secondary students for entering degree courses in Science, Medicine and Engineering. He was transferred to the Science Faculty in 1990, and initially taught Physical Chemistry courses to the undergraduates. He built his research areas in polymer chemistry, and started to lecture polymer courses in 1992 and also accept postgraduate students. He was promoted to associate professor in 1988 and professor in 2000. During sabbatical leaves, he was at the Tokyo Institute of Technology, Japan as a Foreign Research Scholar in 1983-84. He went to the PennState University, USA, as an exchange scholar in 1989-90. He was invited as a visiting professor to the Tokyo University of Agriculture and Technology in May 1990, and to King Mongkut’s Institute of Technology in Thailand, in April 1997. He has more than 45 scientific publications in international journals, and presented over 120 papers in both local and international seminars and conferences. He has authored a few textbooks and dictionaries. He has filed 12 patent applications, received excellent services awards and won medals in a number of exhibitions on his inventions & innovations. He has serve as consultant to many local/international companies. In recent years, his research interest has geared more to natural polymers such as natural rubber, bacterial PHAs, palm oil-based polyesters, nanofibres from electrospinning process, and microspheres for self-healing materials.