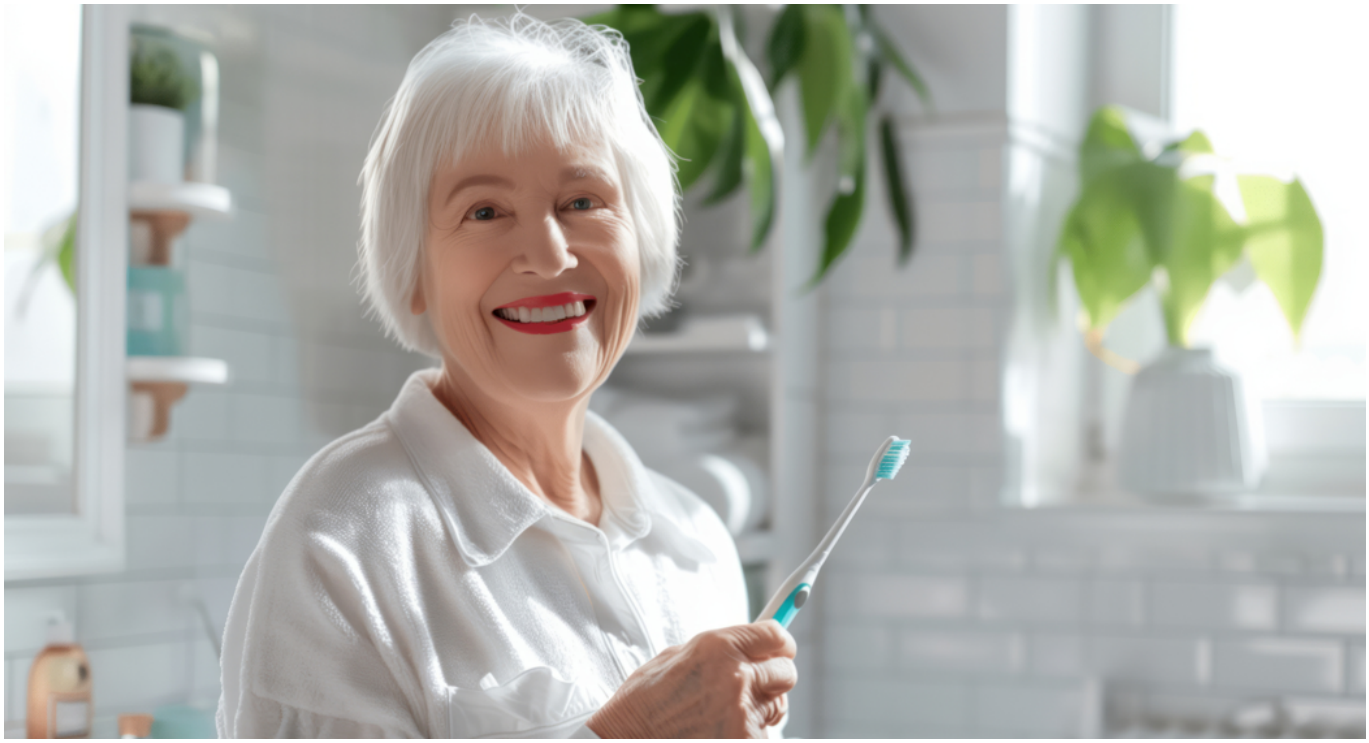
TECH OFFER

Toothpaste Formula for Reducing Tooth Sensitivity



KEY INFORMATION

TECHNOLOGY CATEGORY:
Sustainability - Sustainable Living
Chemicals - Additives
Chemicals - Bio-based
Materials - Bio Materials

TECHNOLOGY READINESS LEVEL (TRL): TRL7
COUNTRY: THAILAND
ID NUMBER: TO175235

OVERVIEW

Elderly individuals commonly suffer from tooth sensitivity due to enamel erosion, gum recession, and reduced mineral content in their teeth. This sensitivity can make eating, drinking, and maintaining oral hygiene painful and uncomfortable. Conventional toothpastes may offer temporary relief but often fail to restore lost enamel or prevent long-term sensitivity, leaving elderly individuals without a lasting solution.

The developed toothpaste is designed to address these issues through the use of hydroxyapatite extracted from fish bones. Hydroxyapatite, a mineral resembling human bone and tooth structure, effectively replenishes lost minerals, strengthens enamel, and reduces tooth sensitivity. It helps to strengthen the tooth enamel by increasing mineral content and density through its nano-hydroxyapatite particles. The particles integrate into the enamel's matrix, helping to remineralize and restore hardness. The toothpaste coats the teeth, filling microcracks and dentinal tubules, significantly reducing dentinal hypersensitivity, a key cause of

tooth pain in older adults. Additionally, the nano-hydroxyapatite has antibacterial properties, reducing the need for additives like Triclosan. As a result, the toothpaste provides a cost-effective, sustainable, and highly beneficial solution for tooth sensitivity in the elderly, while also supporting environmental conservation and public health.

The collaborator is seeking a partner to provide starting materials, experts in waste management, or with a large-scale production capacity to support R&D and test-bedding for the further development of this technology.

TECHNOLOGY FEATURES & SPECIFICATIONS

The process begins by preparing a calcium source derived from fish bones, which is then carefully mixed and subjected to specific reactions to produce hydroxyapatite. This method ensures the creation of a high-quality, bio-compatible material ideal for dental applications.

- **Hydroxyapotite:** Derived from fish bones, a bio-compatible calcium compound mimics the natural mineral structure of human teeth and bones. Arranged in a hexagonal lattice structure, which integrates seamlessly into tooth enamel, aiding in remineralization and reducing sensitivity.
- **Enamel Strengthening:** The toothpaste replenishes lost minerals, reinforcing tooth enamel and increasing its density, resulting in strong, more resilient teeth.
- **Nanoparticle Integration:** Nanoparticles penetrate microcracks and fill dentinal tubules, providing a protective coating and alleviating dentinal hypersensitivity.
- **Non-toxic and Safe:** Lab-tested to be non-toxic to human cells, ensuring safety for daily use without the need for additives, i.e Triclosan.
- **Antibacterial Properties:** Nano-hydroxyapatite naturally inhibits bacterial growth, helping maintain oral hygiene and reduce the risk of dental issues.

This technology provides a comprehensive solution for tooth sensitivity, enamel protection, and overall oral health, making it particularly beneficial for the elderly.

POTENTIAL APPLICATIONS

- **Dental Industry:** Prevention and treatment of tooth sensitivity, particularly for the elderly and individuals with enamel erosion.
- **Oral Care Products:** Commercial toothpaste formulations focused on reducing tooth sensitivity and improving enamel strength. Natural toothpaste options without additional additives – i.e Triclosan
- **Elderly Care Products:** Targeting common issues like tooth sensitivity and enamel degradation.
- **Supplements:** Bone regeneration and dental care by enhancing bone density and promoting natural bone repair.

MARKET TRENDS & OPPORTUNITIES

The global market for herbal toothpaste is expected to grow significantly over the next few years, with the market value rising from USD 738.23 million in 2022 to a projected USD 1,023.66 million by 2028.

UNIQUE VALUE PROPOSITION

- **Sustainable Dental Technology:** Utilizes hydroxyapatite derived from fish bones to remineralize and protect teeth,

specially designed to reduce tooth sensitivity, particularly in the elderly.

- **Natural Solution:** Replenishes lost minerals and strengthens enamel using fish-derived hydroxyapatite.
- **Environmentally Friendly:** Uses fish bones, a by-product from the food industry, reducing waste and environmental pollution.
- **Cost-Effective Production:** Potentially reducing waste disposal costs for food manufacturers (fish-related).