

Development of solid-supported photoresponsive materials.

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【5 words at most】

Enamel acts as a natural barrier to protect the teeth from degradation caused by acid and food. Mesoporous bioactive glass is a biocompatible material that has been found to partially re-establish the integrity of enamel. Surface modification of mesoporous bioactive glass provides an opportunity for site-selective ion liberation. The present work explores the synthesis of a novel surface modified mesoporous bioactive glass attached with photoresponsive macrocycle diarylethene to regulate the ion release.

The mesoporous bioactive glass was prepared by the sol-gel method. Photoresponsive unit is attached on the surface by hydrolysis and condensation of alkoxy silane groups. Macrocyclic structures are generated by a self-assembling process guided by non-covalent interactions of carboxylate-guanidinium ion pairs. The products are characterized by NMR, SEM, and tested for bioactivity in artificial saliva.

Photoswitching UV/LED light is used to regulate the release of ions. Detection of [Ca²⁺] is studied to assess the bioactivity on the synthesized materials. The concentration of Ca²⁺ was analyzed by a Ca²⁺ sensor. **【ref. This body consists of 161 words.】**