

46. Title: New class of pH-responsive biodegradable materials with antibacterial properties

Inventor: Prof Josemon Jacob, Department of Materials Science and Engineering

Keywords: Biodegradable polyesters, Antibacterial polymer

Domain: Material Science (Polymers)

Summary: The slow degradability of aliphatic polyesters can be attributed to their poor hydrophilicity. By adopting a quaternization approach on the N-atoms in the polymer backbone, we developed materials with tunable hydrophilicity that are capable of imparting antibacterial activity. This has relevance to the biomedical sector where stimuli-responsive controlled degradation is necessary. Also, it has relevance to packaging industries which requires antibacterial properties in the biodegradable films.

The present technology provides pH-responsive and biodegradable aliphatic polyesters. The developed materials is pH-sensitive, improves hydrophilicity and enhances biodegradability.

Advantages:

- » Materials can be synthesized with controllable degradability
- » Polymeric materials show enhanced hydrophilicity and degradability
- » Quaternization of main-chain N-atoms to induce charges is a promising approach to impart antibacterial properties
- » Simple and readily available raw materials are used.

Applications: Pharmaceutical industries, Packaging)

Scale of Development: Prototype developed and characterization done

Technology Readiness Level: 4

IP Status: Indian Patent Application 202111039914