Skysong Innovations
Advancing the Arizona State University Knowledge Enterprise

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Bio-agent for Extraction of Asphaltene from Silica Tank (BEAST)

-Background

Bitumen, also known as asphalt, is a mixture of hydrocarbons and is used in roads, runways, bridge decks, roofs, and in other waterproofing materials. In the construction industry, recycling asphalt pavement has both economic and environmental benefits. Reclaimed asphalt pavement (RAP), which is typically prepared from old roads, can be used as an alternative material in the construction or reconstruction of roads. During the recycling process, aged bitumen is extracted from stone aggregates using a solvent-wash approach and is re-blended for reuse. However, this approach is harmful to the environment due to the toxicity of the solvent-wash. Hence, a sustainable method is needed to recover bitumen in asphalt recycling.

Invention Description

Researchers at Arizona State University have developed a novel bioagent (BEAST) to recover and rejuvenate bitumen used in asphalt and other materials. BEAST facilitates separation of the bitumen in reclaimed asphalt and simultaneously peptizes and rejuvenates the bitumen for reuse. The recovered bitumen can be recycled and used in the production of new asphalt. BEAST can also clean deposited crude oil compounds by separating out hydrocarbons.

Potential Applications

- Asphalt recycling
- Cleaning oil-contaminated soils and sands
- Un-clogging crude oil compounds from pipes or other facilities in petroleum production lines

Benefits and Advantages

- Reduction or elimination of toxic solvents used in conventional asphalt recycling
- Extracted bitumen can be upcycled
- Enhanced water damage resistance in recycled and rejuvenated bitumen
- Environmentally friendly cleaning method for soil, sands, and stones
- Mitigate serious environmental damage related to oil spills

Related Publications:

Robust cleaning mechanism permanently detaches hydrocarbon species from silicate surfaces by amphiphiles

A multifunctional bio-agent for extraction of aged bitumen from siliceous surfaces