

BIOCHEM show case

Develop biodegradable surfactants

Problem

Surfactants are chemicals that reduce the surface tension of water and are widely used in soaps, detergents, and many personal care products. Industrially they find applications reducing foaming in lubricants, textile processing, mining, petroleum recovery, and wastewater treatment. Most currently used surfactants are derived from petroleum feedstocks. The global surfactant consumption is approximately 16 million tons per year. Many of these hydrocarbon based surfactants pose significant environmental issues because they form harmful compounds from incomplete biodegradation in water or soil.

Technical solution

Jeneil Biosurfactant Company has successfully exploited a surfactant formed in nature by bacteria. Rhamnolipid surfactants are glycolipids found in soils and plants. Jeneil produces this biosurfactant commercially in controlled, aerobic fermentations using particular strains of the soil bacterium, *Pseudomonas aeruginosa*.

These surfactants provide good emulsification, wetting, detergency, and foaming properties, along with very low toxicity. They are readily biodegradable and leave no harmful or persistent degradation products.

The rhamnolipid biosurfactants have found applications as diverse as cleaning solutions for contact lenses, agricultural fungicides and environmental remediation (oil and heavy metal residues). They can also be formulated together with synthetic surfactants allowing a substantial reduction in the synthetic component.

Benefits

The biosurfactants have:

- **Low toxicity**

- **Full biodegradability**
- **Higher performance at extreme temperatures**
- **Renewable raw materials**
- **Lower energy and complexity of manufacture**

Further information

EPA 2004 small business award

<http://www.epa.gov/greenchemistry/pubs/pgcc/winners/sba04.html>