4-17-2013

The Development, Formulation and Stability of Suds and Antifoam for Heavy Duty Liquid Laundry Detergents

Follow this and additional works at: https://ecommons.udayton.edu/stander_posters

Recommended Citation
https://ecommons.udayton.edu/stander_posters/330
The Development, Formulation and Stability of Suds and Antifoam for Heavy-Duty Liquid Laundry Detergents

Erin Roark, BCM
Chemistry Department
Advisor: Dr. Mark Masthay

Abstract
While suds is one indication of chemicals at work in laundry detergent, it can interfere with cleaning performance in the washing machine. The background of foam, surfactants, consumer perception, antifoam, surface tension and silicone will be discussed followed by various properties and chemical compounds that are best for suds suppression.

Background - Bubbles
- Size distribution
- Gravity drainage
- Thinning of liquid lamellae
- Bubble coalescence

Surfactants
- Moves toward “surfaces”
- Helps dissolve what’s not soluble
- Lowers surface tension

Antifoams
- Defoamer – breaks existing foam
- Antifoam – prevents foam
  - Non-polar oils
  - Polar oils
  - Hydrophobic solids
- Slow and fast
- Hydrophobic silica
- Silicone oil (PDMS)

Antifoam Mechanisms
- Hydrophobic solids (silica) reduce energy needed to penetrate the entry barrier
- Liquid drainage thins lamella = strain
- Oil stretches with film

Conclusions
- Antifoams are underestimated
- Enhances consumer perception
- Silicone-based are so far the best
- Next Steps
  - Sustainable detergents
  - Cost-reducing materials
  - Synthesize for lower viscosity with high viscosity properties
  - Reduce antifoam aggregation

Consumer Perception
- Visible suds = doing its job
- Too many suds = more resources used, costs more money

Acknowledgements
- Dr. Mark Masthay
- Dr. Stephanie Urbin
- Bernie Kluesener
- UD Chemistry Department
- Dr. Carissa Krane
- UD Honors Program
- Friends, family, colleagues