



Bayer: Antiviral Coating

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Introduction/Background

Problem:

- High spread of HAIs (hospital-acquired or nosocomial infections)
- 1.7 million cases of HAIs¹ and about 99,000 deaths² attributed to HAIs each year in US
- Project sponsored by Bayer to reexamine surface materials for anti-microbial effects

Gap:

- Limited knowledge of regularity of sanitization and improper sanitization
- High cost for complete sanitization

Current Solutions

- Frequent cleaning/sanitization
- Corrosive cleaning products (bleach)
- UV light

Needs Statement: A way of modifying the surface of Bayer injectors to improve disinfectant properties to decrease the incidence of Hospital-Acquired Infections and breakouts.



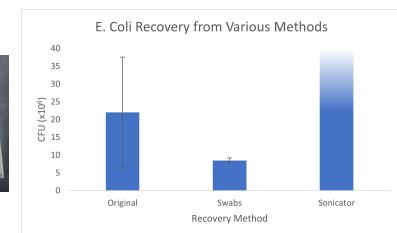
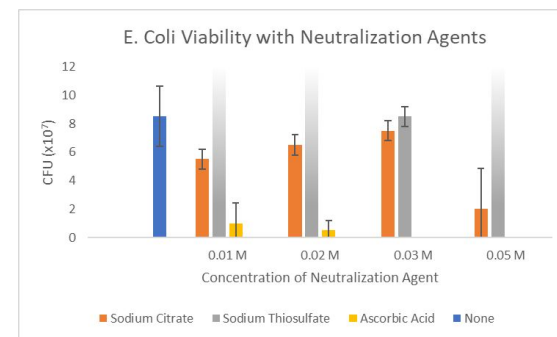
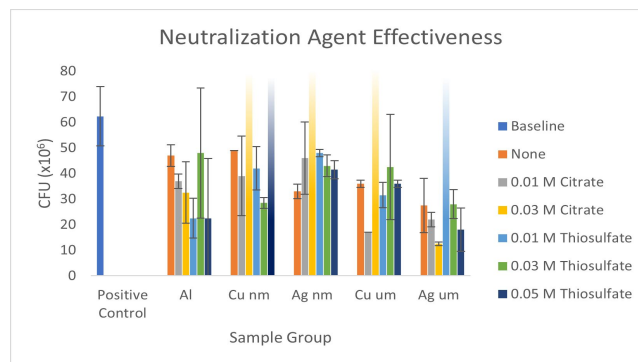
Methods

Protocol informed by ASTM E2180, E2315, E1891, E1054, and E2756. Similar to JIS Z2801/ISO22196.

Methodology

- Plating and Spectrophotometer
- Bioburden Recovery Test
- Neutralization and Toxicity Test
- Acceptance Criteria

Results



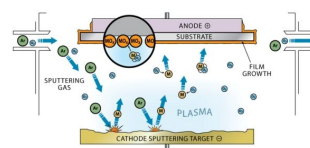
Summarized Findings:

- Neutralization testing results reflect several optimal neutralization conditions
- Toxicity testing results disqualify ascorbic acid and 0.05 M sodium citrate as neutralization agents
- Recovery testing results inconclusive due to experimental error



Proposed Solution

- Sputter coating silver and copper onto aluminum (the base of the injector)
- Silver and copper have antiviral properties
- Comparison of coated and uncoated samples for optimal coating and thickness



		Target		
		Copper	Silver	Zinc
Substrate	Aluminum	✓	✓	✗
	PC-ABS	✗	✗	✗

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