

# Ammonium Hydroxide as a Catalyst for Vapor Phase Deposition of Silanes

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## Executive Statement:

This technology introduces an environmentally friendly, cost-effective, and reliable method for silane deposition using ammonium hydroxide as a catalyst.

## Technology Overview:

The study conducted by Dr. Matthew R. Linford and Vipul Gupta at Brigham Young University focuses on the use of ammonium hydroxide for catalyzing the vapor phase deposition of silanes. This process is aimed at improving the efficiency of silane deposition by facilitating the removal of hydrogen from silanol groups, thereby enhancing siloxane bond formation. The research includes experimental data that demonstrates the impact of varying concentrations of ammonium hydroxide on the deposition process, evidenced by changes in contact angles and surface roughness.

## Key Advantages:

- Environmentally friendly alternative to traditional catalysts
- Cost reduction in the deposition process
- Improved process reliability and efficiency
- Less toxic compared to other amines and ammonia gas
- Enhanced siloxane bond formation for better surface modifications

## Problems Addressed:

- High toxicity and environmental impact of traditional amines and ammonia gas used as catalysts
- High costs and inefficiencies in current silane deposition processes
- Challenges in achieving reliable and efficient silane surface modifications

## Market Applications:

- Semiconductor manufacturing
- Coatings and surface treatments
- Adhesives and sealants industry
- Medical device surface modifications
- Environmental technology applications