



Non-Confidential Description

Multi-use Aminofunctional Alkoxy Polysiloxanes

Technology Case: RFT-71

Invention Summary

This invention involves synthesized polysiloxanes that exhibit selectivity of hydroxyl moiety in a cost-effective, stable conversion.

Benefits

- With 100% selectivity of the hydroxyl moiety, potential market applications include coatings, adhesives, sealants, rubbers, elastomers, catalyst supports, sol-gel/ceramic precursors, components in molecular sieves, chromatography columns, polyelectrolytes and electrochemical sensing devices.
- Minimal purification required with only hydrogen gas produced as side product.
- Cost-effective production, relative to the comparable hydrosilation process.
- Extended shelf life for amino-silicones.

Invention Premise

Linear and cyclic polysiloxanes with pendant amine moieties have been synthesized with hydroxyalkyl-amines. The reaction exhibits 100% selectivity of the hydroxyl moiety over the amine moiety of aminoalcohols at the reactive Si-H site, leaving the pendant amine functionality intact on the product. No side reactions, including that of rearranging the polysiloxane backbone occurs. The reaction is a one-pot process with minimal purification required since the only side product is hydrogen gas. Compared to the hydrosilation process, the process is cost effective on a per/mole catalyst basis. The amino-silicone end products have an extended shelf life (months) under normal precautions.

Patents

This technology is patented with fully preserved US patent rights (issued US patent 6,482,912), and is available for licensing/partnering opportunities.

The Lead Inventor



Philip Boujock, PhD

VP for Research, Creative Activities and Technology Transfer

Dr. Philip Boudjouk was named NDSU's first Vice President for Research, Creative Activities and Technology Transfer in March 2000. Boudjouk has been active as a teacher, researcher, and member of the NDSU Department of Chemistry faculty since 1973. He earned his bachelor's degree at St. John's University, Jamaica, N.Y., and his doctorate in chemistry from the University of Wisconsin-Madison. Prior to his appointment at NDSU, he held a Teaching and Research Fellowship at the University of California at Davis for two years.

Boudjouk's research career has focused on organometallic chemistry with emphases on organosilicon compounds, polymers, catalysis, materials research, and sonochemistry. He has more than 130 refereed publications in international journals and holds 19 patents. He has been the thesis advisor for 20 Ph. D. students and 22 M.S. students. Boudjouk has been a guest lecturer at over 40 universities in Europe and Asia.

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