



## 0946: Innovative wood treatments with hybrid inorganic-organic polymers and a proposal for drywood termites standard testing protocol

**Monday, September 26, 2016**

**01:45 PM - 02:00 PM**

**📍 Convention Center - Room W230 A**

**Introduction:** Wood is a renewable resource widely used as a structural material and for a variety of artefacts, thanks to its particularly advantageous mechanical properties and aesthetic characteristics. However, due to its organic nature, it is subjected to physical and biological deterioration. A novel treatment based on polyamidoamines (PAAs) functionalized with siloxanes was developed and patented. PAAs were synthesized by nucleophile addition of ethanolamine (EtA) and/or 3-aminopropyltriethoxysilane (APTES) to N,N'-methyl-bis-acrylamide (MBA). Considering the technology and products for wood protection in EU and USA, the existing standard norms to test effectiveness against termites are exclusively focused on subterranean species (Rhinotermitidae). Due to great differences in bio-ethology, they are not suitable for drywood termites (Kalotermitidae), that are increasingly indicated as serious wood pests.

**Methods:** The present work tested the efficacy of three PAAs formulations (named A, B, C) as wood preservatives, using the standard EN 118 for the subterranean *Reticulitermes lucifugus* and a purposely developed protocol for the drywood termite *Kalotermes flavicollis*.

**Results/Conclusion:** All PAAs formulations were characterized by ESI-MS, NMR, FTIR. Our bioassays used the EN 118 protocol, and all formulations were effective in preserving wood against *R. lucifugus*, resulting in negligible wood consumption and significantly higher mortality than controls. Regarding *K. flavicollis*, all formulations resulted in a significant reduction of wood damage and formulation B was the most effective at increasing termite mortality. Overall, PAAs treatments look promising as innovative wood preservatives against termites, with low effective concentration, low environmental impact and good fixation qualities into the wood.

doi: 10.1603/ICE.2016.93868

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