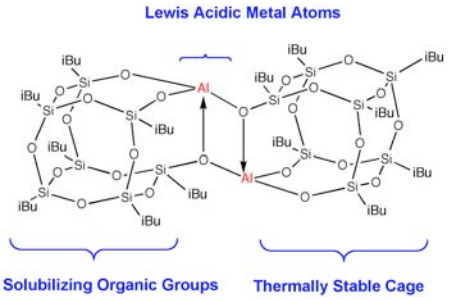
Aluminum POMS®



Aluminum POMS® utilizes nanodispersion technology to achieve a low cost and highly active catalyst for epoxy and bismaleimide cure. Advantages of Al POMS catalyst include lower cure temperature, increased degree of cure, less heat distortion, and very low catalyst migration.

High Activity. This silicon-oxygen cage framework is electron withdrawing and consequently renders a highly Lewis acidic aluminum atom. This in turn provides a highly activated aluminum atom and affords lower effective loadings of catalysts than can be achieved with siloxane based catalysts or organometallics. The advantage of the higher activity is reduced cycle time.

Greater Surface Area. The nanoscopic size of POMS cages provides very high surface area on the order of 3700 m^2 at a 1 wt% loading. This large surface area enables greater reactivity which aids in cure completion.

Polymer Chain Interaction. Al POMS has a melting point of 285 °C which makes it stable and reactive in thermal-cure epoxies and bismaleimide resins. An Al POMS cured epoxy resin system often shows retainment of modulus at elevated temperatures and realization of higher use temperatures due in part to greater degree of cure and interaction of the network with POMS cages.

Organic Compatibility. Al POMS are colorless, nonvolatile solids that dissolve into epoxy and bismaleimide components. Because POMS are chemicals, rather than particles, they follow the Gibbs equation and are not subject to limitations of particulate dispersion nor are they limited to microscopic phase separation as are polymeric catalyst carriers.

Suggested Applications as catalyst for epoxies, particularly cycloaliphatics, and bismaleimide resins.

Future Developments. We are able to make analogous POMS aluminum cages with different compatibilizing groups in place of i-Butyl. This enables matching of the Al POMS to polymer formulations of different polarity.

Availability as dry powders in R&D and bulk quantities or as predispersed concentrates suitable for use as component diluents. For additional technical information please contact Hybrid Plastics at info@hybridplastics.com