

New Classes of Catalysts for Hydrosilylation Reactions

Magali Puillet¹, Delphine Crozet¹, Jean Raynaud¹, Magali Bousquié² and Vincent Monteil*¹

¹ *Laboratoire de Chimie Catalyse Polymères et Procédés (C2P2) Université de Lyon, Univ. Lyon 1, CPE Lyon, CNRS, Villeurbanne, France*

² *Elkem Silicones France SAS*

Based on silicon and oxygen backbone, silicones are high-performance polymers. Their properties can be tuned by modifying organic groups on silicon atom. To build the polysiloxane chain, the hydrosilylation reaction, i.e. addition of a hydrosilane or hydrosiloxane moiety across a carbon-carbon double bond, is a key reaction not only for the synthesis of functional silanes or polysiloxanes but also for the manufacturing of silicone materials. Although hydrosilylation has been known for more than 50 years, industrial catalytic systems are mainly based on Platinum (chloroplatinic acid, Karstedt catalyst).^[1]

Up to date, regarding in particular activity and selectivity, Karstedt catalyst remains the best catalyst known for hydrosilylation in silicon media. For many reasons, in particular economical ones, the development of original platinum-free catalysts for the hydrosilylation reaction and crosslinking of silicone materials is nowadays an important target. Alternatives catalysts based on other metals such as rhodium, iridium, ruthenium, nickel and more recently iron or cobalt have been also developed.^[1,2]

In the recent period we investigated metal complexes bearing chelating ligands based on first row late transition metals for hydrosilylation of olefins (such as octene...) and crosslinking under non-inert atmosphere of silicone materials. High selectivities for hydrosilylation products (up to 90%) were obtained even at low temperature.^[3]

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