

The interaction of neutral frame (copper-)phenylsiloxane with alkaline organosilanolates

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Abstract

The reaction mechanism of neutral frame metallosiloxanes with alkaline silanolates [RSi(O)OM] (M = Na, K, Li; R = C₆H₅- and CH₂=CH-) has been studied on the example of frame sandwich-like (copper-)phenylsiloxane [PhSiO₂]₆Cu₆[PhSiO₂]. At mild conditions bimetallic frame Cu₂M-phenylsiloxanes of the same sandwich-like structure are formed (yield ≤ 92%). That compound contains a typical cluster structures [Cu₄M₄] formed both by substitution of Cu²⁺ ions in the clusters [Cu₆] on alkaline M⁺ ions, as well as the binding of silanol anions with Cu²⁺ cations, leaving the clusters [Cu₆].

At rigorous conditions (higher temperature and reaction time) we have the skeleton isomerization of the molecules to form a "secondary" frame structures, as well as "hybrid" metallosiloxanes in the later stages of the process. The composition and structure of the products were identified by elemental analysis, and by destructive silylation MOC, followed by analysis of TMS-derivatives produced by GPC and NMR-¹H.