29Si NMR Phenylsilane Polymer Analysis

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^{29}Si NMR IN PHENYLSILANE POLYMER ANALYSIS

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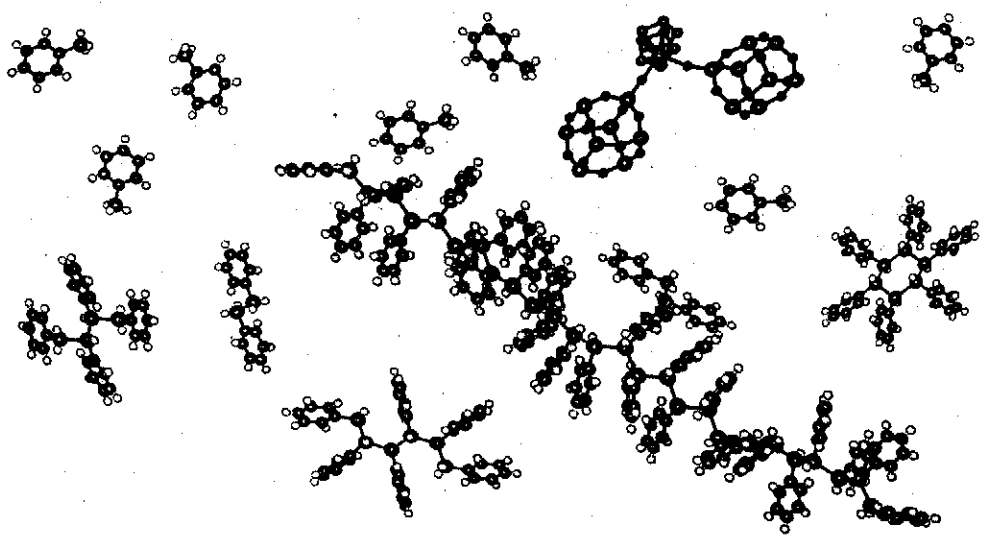
Here, we focus on the analysis of dehydrocoupling polymerization reactions of phenylsilane. The molar mass distribution depends on the catalytical system and can be easily monitored by on-flow LC-NMR experiment. The weight average molar mass (M_w) of the polymerization products can vary from several silane units up to 4100 g.mol^{-1} in our particular cases. Via comparison of three different experiments, the ^{29}Si{^{1}H} INEPT with the polarization transfer over one bond (~200 Hz) and over three bonds from the ortho hydrogen (~7 Hz) and the standard ^{29}Si{^{1}H} NMR we see that there are present silicon atoms in the structure without directly bonded hydrogen but still with a phenyl group. The ^{1}H → ^{29}Si-^{29}Si INEPT-INADEQUATE experiment was run to investigate the neighborhood of these silicon units to distinguish whether they belong to the branched oligomers or to the products of rearrangement reactions and contain more than one phenyl group within one silane unit. The ^{1}H → ^{29}Si DOSY experiment provides valuable information about the length of these oligosilanes.



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References

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