



Preparation and post-processing of silyl-terminated polyethylenes (SiPE)

V. Varga, V. Ralis, M. Lamac, M. Horacek, J. Pinkas

J. Heyrovsky Institute of Physical Chemistry of ASCR, Prague, Czech Republic

In recent years we have investigated hydrosilane/ $B(C_6F_5)_3$ (HSB) system for the activation of early transition metal halide complexes and utilization of thereof generated catalytic systems for catalytic (co)polymerization of olefins and hydrodehalogenation.^[1]

Herein, we would like to present utilization of HSB system for activation of transition metal (TM) complexes (based on Ti, Ni, and Fe central atom) for production of silyl-terminated polyethylenes (SiPE). The effect of hydrosilane and TM complex on polymer architecture (linear vs. branched, see Figure below), molecular weight, character of terminal group, as well as mechanism of activation of particular complexes will be discussed. In addition, post-modification of terminal silyl group in SiPE with aim to obtain otherwise inaccessible materials will be presented.

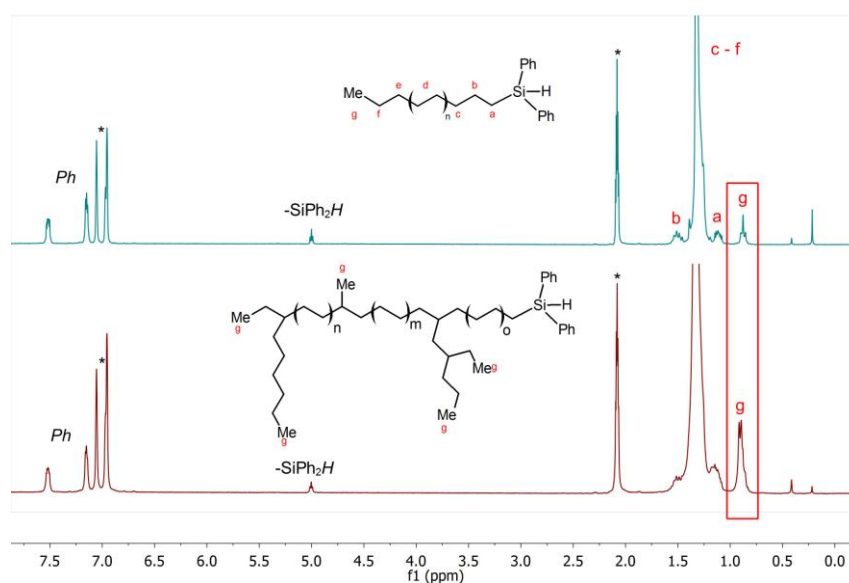


Figure. 1H NMR spectra of SiPE (measured in toluene- d_8 at 100 °C) prepared by Ti cat./ $H_2SiPh_2/B(C_6F_5)_3$ (top) and Ni cat./ $H_2SiPh_2/B(C_6F_5)_3$ (bottom) systems. Spectra are normalized to Ph signals.

References

- [1] (a) V. Varga, M. Lamač, M. Horáček, R. Gyepes, J. Pinkas, *Dalton. Trans.* **2016**, 45, 10146-10150; (b) V. Varga, M. Večeřa, R. Gyepes, J. Pinkas, M. Horáček, J. Merna, M. Lamač, *ChemCatChem* **2017**, 9, 3160-3172; (c) V. Varga, J. Pinkas, I. Císařová, J. Kubišta, M. Horáček, K. Mach, R. Gyepes, *Eur. J. Inorg. Chem* **2018**, 2637-2647; (d) D. Dunlop, J. Pinkas, M. Horáček, N. Žilková, M. Lamač, *Dalton. Trans.* **2020**, 49, 2771-2775.

Acknowledgement: This research was supported by the Czech Science Foundation (project 21-01308S)