second time. Recrystallization from CH_3CN yielded **2** (62 mg, 50%) as a brown powder.

Complexes **1** and **2** were identified by comparison to the reported spectroscopic data (UV/Vis for both, ^{1}H NMR for **2**)[3, 4] and by redox titration.

3: Isolated in 50% yield based on **2**. UV/Vis (CH_3OH): $\lambda_{max}(\varepsilon) = 618$ (140). FAB-MS (calcd. for $C_{24}H_{44}N_6O_8Cu_2$): 671 ($[M^+ - H]$). Crystals: $0.33 \times 0.16 \times 0.05$ mm, triclinic $P\bar{1}$, $a = 11.659(1)$, $b = 11.854(1)$, $c = 15.695(1)$ Å, $\alpha = 97.48(1)$, $\beta = 101.75(1)$, $\gamma = 101.87(1)^\circ$, $V = 2044.5(5)$ Å^3, $Z = 2$, $\rho_{calcd} = 1.389$ g cm^{-3}. Nonius KappaCCD diffractometer, $Mo_{K\alpha}$ ($\lambda = 0.7107$ Å), 161 K, ω scans, 33764 measured, 7769 independent, 5258 observed reflections [$F > 3\sigma(F)$]. Solved by direct methods (SIR92)[18] and refined using maXus (MacScience, Japan, 1997). $R = 0.057$ [$F > 3\sigma(F)$], $wR = 0.068$ for 460 parameters, $\Delta\rho_{max/min} = 1.49$, -0.97 e Å^{-3}. Crystallographic data (excluding structure factors) for the structure reported in this paper have been deposited with the Cambridge Crystallographic Data Center as supplementary publication no. CCDC-102174. Copies of the data can be obtained free of charge on application to CCDC, 12 Union Road, Cambridge CB2 1EZ, UK (fax: (+44) 1223-336-033; e-mail: deposit@ccdc.cam.ac.uk).

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Half-Sandwich Alkyl and Hydrido Complexes of Yttrium: Convenient Synthesis and Polymerization Catalysis of Polar Monomers**

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Structurally well characterized organometallic complexes of rare earth metals[1] such as lanthanocene hydrides and alkyls of the type $[\{(\eta^5\text{-}C_5R_5)_2LnX\}_2]$ (X = H, alkyl) have recently attracted considerable interest as cocatalyst-free homogeneous polymerization catalysts for both nonpolar and polar monomers.[2] Catalyst systems based on complexes with only one cyclopentadienyl ligand are anticipated to show greater activity towards sterically more demanding monomers.[3] However, conventional synthesis of mono(cyclopentadienyl) rare earth complexes $[(\eta^5\text{-}C_5R_5)LnX_2(L)_n]$, where at least one ligand X is a hydride or alkyl, is often hampered by ate-complex formation with concomitant alkali metal salt incorporation.[3, 4] Consequently, only a limited number of this type of half-sandwich complexes has been synthesized, and their catalytic performance still remains unexplored.[5] We report here a remarkably facile alkane elimination as a route[6] to yttrium complexes of the type $[(\eta^5\text{-}C_5Me_4SiMe_2X')YX_2(thf)]$, as well as preliminary results on the polymerization of *tert*-butyl acrylate and acrylonitrile with these complexes.

Reaction of $[Y(CH_2SiMe_3)_3(thf)_2]$ (**1**)[7] with $(C_5Me_4H)SiMe_2X'$ (X′ = $NHCMe_3$, Me, Ph, C_6F_5) in pentane at 0 °C for 2 h resulted in the quantitative formation (according to ^{1}H NMR spectroscopy) of the half-sandwich yttrium complexes $[(\eta^5\text{:}\eta^1\text{-}C_5Me_4SiMe_2NCMe_3)Y(CH_2SiMe_3)(thf)]$ (**2**) or $[(\eta^5\text{-}C_5Me_4SiMe_2X')Y(CH_2SiMe_3)_2(thf)]$ (**3**) along with tetramethylsilane (Scheme 1, Table 1). The linked amido-cyclopentadienyl complex **2** was isolated as colorless crystals. Complexes **3a**–**c** are colorless to slightly yellow crystals which melt below room temperature. All complexes are readily soluble in aliphatic and aromatic hydrocarbons. Remarkably, no formation of the metallocene complex could be observed by ^{1}H NMR spectroscopy: The excess cyclopentadiene was left unchanged even in the presence of two equivalents of $(C_5Me_4H)SiMe_3$. The presence of the silicon substituent on cyclopentadiene is crucial for this complexation reaction to be successful. Mixtures of mono- and bis(cyclopentadienyl) complexes were obtained when silicon-free cyclopentadienes such as C_5Me_5H or $C_5Me_4H_2$ were employed.

When complexes **2** and **3** are in solution at room temperature, the coordinated thf groups are labile on both the chemical and NMR time scale. This is shown by the instantaneous exchange of all coordinated thf molecules upon addition of excess $[D_8]$THF and the substantial high-field

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Table 1. Selected spectroscopic data of **2**, **3a–c**, and **4**. NMR spectra in [D$_6$]benzene at 400 MHz (^{1}H), 100.6 MHz (^{13}C), 79.5 MHz (^{29}Si), and 376.4 MHz (^{19}F) and at 25 °C (unless stated otherwise).

2: ^{1}H NMR: $\delta = -0.93$ (d, ^2J(Y,H) = 3.1 Hz, 2H, Y-CH$_2$), 0.28 (s, 9H, CH$_2$SiCH_3), 0.74 (s, 6H, SiCH$_3$), 1.02 (m, 4H, β-CH$_2$, thf), 1.38 (s, 9H, C(CH$_3$)$_3$), 2.04, 2.19 (s, 6H, ring CH$_3$), 3.30 (m, 4H, α-CH$_2$, thf); ^{13}C NMR: $\delta = 4.7$ (CH$_2$SiCH$_3$), 8.4 (NSiCH$_3$), 11.5, 14.0 (ring CH$_3$), 24.7 (β-CH$_2$, thf), 26.2 (d, ^1J(Y,C) = 44.9 Hz, YCH$_2$), 36.0 (C(CH$_3$)$_3$), 54.0 (C(CH$_3$)$_3$), 70.7 (α-CH$_2$, thf), 106.6 (ring C at Si), 122.3, 126.4 (ring C); ^{29}Si NMR: $\delta = -25.0$ (NSiMe$_2$), -2.7 (d, ^2J(Y,Si) = 1.9 Hz, CH$_2$SiMe$_3$)

3a: ^{1}H NMR: $\delta = -0.61$ (d, ^2J(Y,H) = 3.1 Hz, 4H, YCH$_2$), 0.30 (s, 18H, CH$_2$SiCH_3), 0.41 (s, 9H, SiCH$_3$), 1.15 (m, 4H, β-CH$_2$, thf), 1.96, 2.24 (s, 6H, ring CH$_3$), 3.52 (m, 4H, α-CH$_2$, thf); ^{13}C NMR: $\delta = 2.6$ (SiCH$_3$), 4.6 (CH$_2$SiCH$_3$), 11.5, 14.6 (ring CH$_3$), 24.8 (β-CH$_2$, thf), 34.7 (d, ^1J(Y,C) = 43.7 Hz, YCH$_2$), 70.4 (α-CH$_2$, thf), 115.0 (ring C at Si), 123.3, 126.4 (ring C); ^{29}Si NMR: $\delta = -10.3$ (SiMe$_3$), -3.2 (d, ^2J(Y,Si) = 2.1 Hz, CH$_2$SiMe$_3$)

3b: ^{1}H NMR: $\delta = -0.58$ (d, ^2J(Y,H) = 3.1 Hz, 4H, YCH$_2$), 0.30 (s, 18H, CH$_2$SiCH_3), 0.69 (s, 6H, Si(CH_3)Ph), 1.20 (m, 4H, β-CH$_2$, thf), 1.97, 2.15 (s, 6H, ring CH$_3$), 3.47 (m, 4H, α-CH$_2$, thf), 7.17 (m, 3H, C$_6$H$_5$), 7.53 (m, 2H, C$_6$H$_5$); ^{13}C NMR: $\delta = 1.8$ (Si(CH$_3$)Ph), 4.6 (CH$_2$SiCH$_3$), 11.6, 14.8 (ring CH$_3$), 24.9 (β-CH$_2$, thf), 34.9 (d, ^1J(Y,C) = 43.7 Hz, YCH$_2$), 70.0 (α-CH$_2$, thf), 112.6 (ring C at Si), 123.6, 127.1 (ring C), 128.0, 128.8, 134.3 (C$_6$H$_5$), 141.6 (*ipso*-C$_6$H$_5$); ^{29}Si NMR: $\delta = -13.8$ (SiMe$_2$Ph), -3.2 (d, ^2J(Y,Si) = 2 Hz, CH$_2$SiMe$_3$)

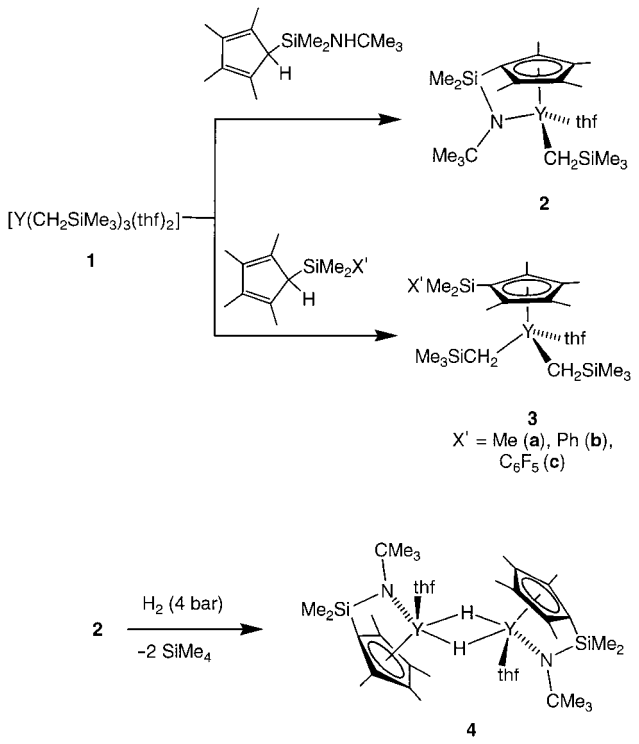
3c: ^{1}H NMR: $\delta = -0.65$ (d, ^2J(Y,H) = 3.1 Hz, 4H, YCH$_2$), 0.28 (s, 18H, CH$_2$SiCH_3), 0.78 (t, 6H, ^5J(F,H) = 1.6 Hz, Si(CH_3)C$_6$F$_5$), 1.25 (m, 4H, β-CH$_2$, thf), 1.85, 2.19 (s, 6H, ring CH$_3$), 3.50 (m, 4H, α-CH$_2$, thf); ^{13}C NMR: $\delta = 2.6$ (Si(CH$_3$)C$_6$F$_5$), 4.5 (CH$_2$SiCH$_3$), 11.4, 14.3 (ring CH$_3$), 25.0 (β-CH$_2$, thf), 35.0 (d, ^1J(Y,C) = 43.7 Hz, YCH$_2$), 69.9 (α-CH$_2$, thf), 110.0 (ring C at Si), 112.3 (*ipso*-C$_6$F$_5$), 123.9, 126.9 (ring C), 136.2, 147.8, 150.2 (m, C$_6$F$_5$); ^{29}Si NMR: $\delta = -13.8$ (SiMe$_2$C$_6$F$_5$), -3.2 (d, ^2J(Y,Si) = 1.8 Hz, CH$_2$SiMe$_3$); ^{19}F NMR: $\delta = -105.6$ (m, *o*-C$_6$F$_5$), -130.7 (t, ^3J(F,F) = 21 Hz, *p*-C$_6$F$_5$), -139.0 (m, *m*-C$_6$F$_5$)

4: ^{1}H NMR ([D$_8$]toluene, 50 °C): $\delta = 0.69$ (s, 6H, SiCH$_3$), 1.36 (s, 9H, C(CH$_3$)$_3$), 1.46 (br m, 4H, β-CH$_2$, thf), 2.09, 2.22 (s, 6H, ring CH$_3$), 3.82 (br m, 4H, α-CH$_2$, thf), 5.50 (t, 1H, ^1J(Y,H) = 28.8 Hz, Y$_2$H$_2$); ^{13}C NMR ([D$_8$]toluene, 50 °C): $\delta = 8.6$ (SiCH$_3$), 12.2, 14.3 (ring CH$_3$), 25.2 (β-CH$_2$, thf), 36.8 (C(CH$_3$)$_3$), 55.0 (C(CH$_3$)$_3$), 72.1 (α-CH$_2$, thf), 108.5 (ring C at Si), 125.8 (ring C); ^{29}Si NMR ([D$_8$]toluene, 50 °C): $\delta = -25.5$

4 (major isomer): ^{1}H NMR ([D$_8$]toluene, -40 °C): $\delta = 0.81$, 0.95 (s, 3H, SiCH$_3$), 1.17 (m, 4H, β-CH$_2$, thf), 1.52 (s, 9H, C(CH$_3$)$_3$), 2.02 (s, 6H, ring CH$_3$), 2.11, 2.54 (s, 3H, ring CH$_3$), 3.47, 3.85 (br m, 2H, α-CH$_2$, thf), 5.27 (t, 1H, ^1J(Y,H) = 29.0 Hz, Y$_2$H$_2$); ^{13}C NMR ([D$_8$]toluene, -40 °C): $\delta = 8.2$, 9.3 (SiCH$_3$), 12.1, 12.3, 13.9, 14.7 (ring CH$_3$), 25.0 (β-CH$_2$, thf), 36.3 (C(CH$_3$)$_3$), 54.7 (C(CH$_3$)$_3$), 72.7 (α-CH$_2$, thf), 107.1 (ring C at Si), 119.6, 122.8, 126.0, 126.2 (ring C); ^{29}Si NMR ([D$_8$]toluene, -40 °C): $\delta = -25.6$

4 (minor isomer): ^{1}H NMR ([D$_8$]toluene, -40 °C): $\delta = 1.20$ (m, 4H, β-CH$_2$, thf), 1.44 (s, 9H, C(CH$_3$)$_3$), 2.05, 2.14, 2.20, 2.51 (s, 3H, ring CH$_3$), 3.78 (br m, 4H, α-CH$_2$, thf), 5.45 (t, 1H, ^1J(Y,H) = 28.6 Hz, Y$_2$H$_2$); ^{13}C NMR ([D$_8$]toluene, -40 °C): $\delta = 8.5$, 9.0 (SiCH$_3$), 11.6, 13.3, 14.1, 15.2 (ring CH$_3$), 24.9 (β-CH$_2$, thf), 36.4 (C(CH$_3$)$_3$), 55.0 (C(CH$_3$)$_3$), 72.4 (α-CH$_2$, thf), 107.7 (ring C at Si), 119.9, 123.3, 125.8 (ring C); ^{29}Si NMR([D$_8$]toluene, -40 °C): $\delta = -25.7$

shift of the signals for the α- and β-protons in the ^{1}H NMR spectrum at low temperatures. (Decoalescence of the signals into those for free and coordinated thf was observed at -80 °C for **2**.) The temperature dependence of the equilibrium constants was obtained from the chemical shifts of α- and β-CH$_2$.[8, 9] The plot of ln K versus $1/T$ gave the thermodynamic parameters $\Delta_r H = (24 \pm 3)$ kJ mol^{-1} and $\Delta_r S = (61 \pm 12)$ J K^{-1} mol^{-1} for **2**. The positive reaction entropy and enthalpy is in accordance with a dissociative process. Complex **2** is relatively thermally robust, decomposing by a first-order rate law with a half-life of $t_{1/2} = (600 \pm 10)$ min ($k_1 = (1.92 \pm 4) \times 10^{-5}$ s^{-1}) at 50 °C in [D$_6$]benzene (determined by NMR spectroscopy) to give SiMe$_4$ and other yet unidentifed products of C–H activation. The activation parameters $\Delta H^{\neq} = (145 \pm 16)$ kJ mol^{-1} and $\Delta S^{\neq} = (110 \pm 50)$ J K^{-1} mol^{-1} were calculated from the temperature dependence of the rate constant of the decomposition of **2**. The bis(alkyl) complexes **3a–c** slowly decompose at room temperature.



Scheme 1.

Hydrogenolysis of **2** in pentane at room temperature led to the dimeric hydrido complex **4** as a colorless powder in reproducibly good yield (Scheme 1).[10] The ^{1}H NMR spectrum of **4** at 50 °C in [D$_8$]toluene (Figure 1), with only one hydride signal at $\delta = 5.50$ (^1J(Y,H) = 28.8 Hz), agrees with a molecule with an internal mirror plane. However, this spectrum is the result of fast interconversion of two asymmetric diastereomers. Their interconversion is slowed down sufficiently at -40 °C, so that a ^{1}H NMR spectrum containing two triplets for the bridging hydrides ($\delta = 5.27$, 5.45; ^1J(Y,H) = 29.0 and 28.6 Hz, respectively) as well as a double of all other signals could be obtained. The signal ratio shows that **4** exists as a 4:1 mixture of two asymmetric diastereomers in [D$_8$]toluene.

An ORTEP diagram of the structure of **4** in the solid state is shown in Figure 2.[11] The crystal contains racemic pairs of C_2-symmetric homochiral dimers. Thus, the two linked amido–cyclopentadienyl yttrium units are connected by two hydrogen atoms in a *transoid* fashion. The Y$_2$H$_2$ core is significantly distorted (considering the well-known problem in the refinement of hydrogen atoms), possibly due to steric repulsion between the two (η^5:η^1-C$_5$Me$_4$SiMe$_2$NCMe$_3$) ligands and due to the strong *trans* influence of the amido ligand (Y1–H1 2.48(4), Y1–H2 1.98(6), Y2–H1 2.39(4), Y2–H2 2.31(6) Å;

  1433-7851/99/3801-0228 $ 17.50+.50/0

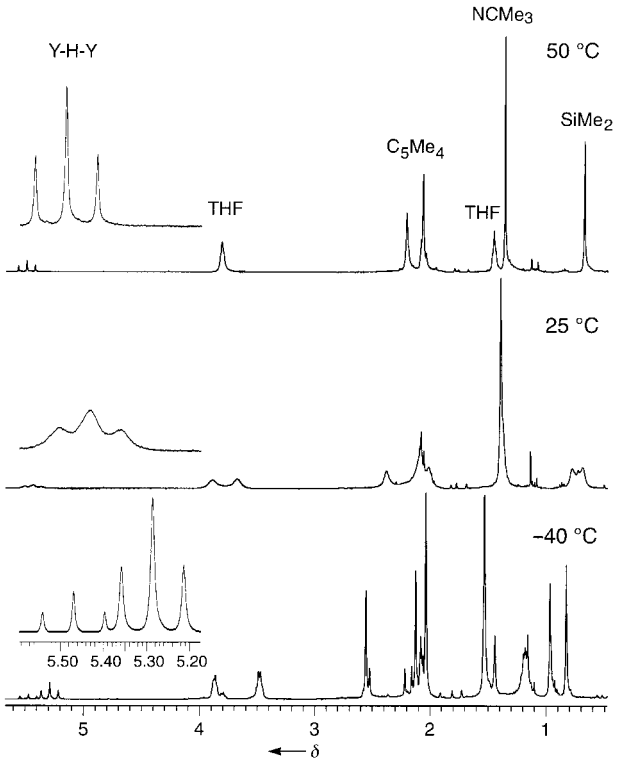


Figure 1. Temperature dependence of the ^{1}H NMR spectrum of **4** in [D_8]toluene.

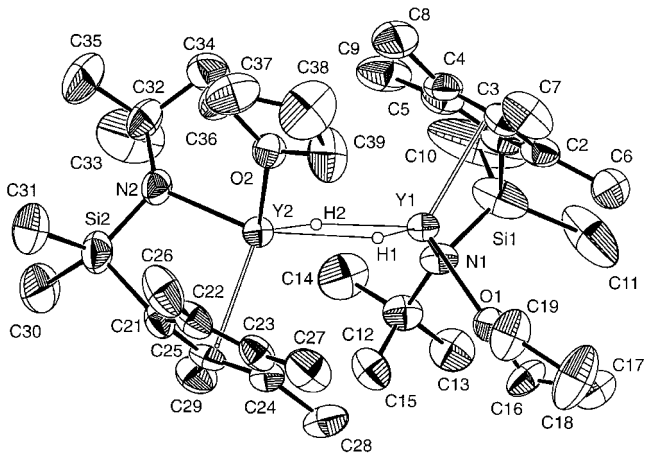


Figure 2. ORTEP diagram of the molecular structure of **4**. Thermal ellipsoids are drawn at the 30% probability level. Hydrogen atoms, except for the two bridging hydrides, are omitted for the sake of clarity. Selected bond lengths [Å] and angles [°]: Y1–H1 2.48(4), Y1–H2 1.98(6), Y2–H1 2.39(4), Y2–H2 2.31(6), $Cp_{cent}1$–Y1 2.351(8), $Cp_{cent}2$–Y2 2.342(8), Y1–N1 2.250(6), Y2–N2 2.237(6), Y1–O1 2.361(5), Y2–O2 2.378(5), Y1···Y2 3.672(1); Y1-H1-Y2 98(2), Y1-H2-Y2 117(2), H1-Y1-H2 74(2), H1-Y2-H2 71(2), Cp_{cent}1-Y1-N1 97.8(2), Cp_{cent}1-Y1-O1 112.6(2), Cp_{cent}1-Y1-H1 105(2), Cp_{cent}1-Y1-H2 119(2), N1-Y1-O1 93.1(2), N1-Y1-H1 156.8(9), N1-Y1-H2 95(2), Cp_{cent}2-Y2-N2 97.4(2), Cp_{cent}2-Y2-O2 113.5(2), Cp_{cent}2-Y2-H1 103(1), Cp_{cent}2-Y2-H2 118(2), N2-Y2-O2 94.8(2), N2-Y2-H1 160(1), N2-Y2-H2 99(1).

Y1-H2-Y2 117(2), Y1-H1-Y2 98(2)°). The Y···Y distance (3.672(1) Å) is comparable to that of other dimeric yttrium hydrido complexes.[12] The Y–N bond lengths (2.250(6) and 2.237(6) Å) are significantly shorter than those observed in the heterobimetallic yttrocenes Li[Y(η^5:η^1-C_5R_4Si-$Me_2NCH_2CH_2X)_2$] ($C_5R_4 = C_5Me_4$, C_5H_3tBu; X = OMe, NMe_2)[13a] and the half-sandwich complex [Li(thf)][Y(η^5:η^1-$C_5Me_4SiMe_2NCH_2CH_2OMe$)(*o*-$C_6H_4CH_2NMe_2$)Cl],[13b] but slightly longer than in (η^5:η^1-$C_5Me_4SiMe_2NCMe_3$)YN(Si-$Me_3)_2$.[13c] In contrast to lanthanocene hydrides, **4** does not undergo H/D scrambling in deuterated solvents and is thermally stable in [D_6]benzene at 50 °C for more than 24 hours.[14]

α-Olefins such as 1-hexene or styrene react sluggishly with alkyl complexes **2** and **3a** (25 °C, [D_6]benzene, several days), whereas the hydrido complex **4** forms well-defined mono-insertion products. Ethene is readily polymerized by all complexes. Moreover, complexes **2**, **3a**, and **4** catalyze the polymerization of polar monomers, such as *tert*-butyl acrylate, and, in contrast to the lanthanocene hydrido and alkyl complexes, they catalyze the polymerization of acrylonitrile as well (Table 2).[15] *tert*-Butyl acrylate is polymerized in the presence of either of the complexes **2**, **3**, or **4** at temperatures as low as −30 °C (i.e., well below the decomposition temperatures) to give poly(*tert*-butyl acrylate) in high yields and with molecular weights M_n greater than 20000. Initiation is somewhat slower when the hydrido complex **4** is used. The molecular-weight distributions of the resulting polymers are in the range of 1.5–2.0,[16] and the polymer microstructure as judged by ^{13}C NMR spectroscopy is predominantly atactic. An intense orange-red solution forms as soon as acrylonitrile is added to a solution of **2, 3a**, or **4** in toluene (λ_{max} (ε) = 353 nm (22000) for **2** in the presence of one equivalent of acrylonitrile), followed by the precipitation of yellow, atactic poly(acrylonitrile). This unusual color is ascribed to an intermolecular charge transfer band between an f^0d^0 complex and an electron acceptor.[17] Rapid chain propagation appears to be preceded by a slow initiation step in which the coordinated thf ligand at the yttrium center is substituted by the monomer to generate the active species, the keteneiminato complex [(η^5-$C_5Me_4SiMe_2X'$)Y(N=C=CHCH$_2$R)], by 1,4-insertion.[18]

Table 2. Polymerization of *tert*-butyl acrylate and acrylonitrile by **2**, **3a**, and **4** in toluene.

Cat.	T [°C]	t [h]	[M_0]/[cat.]	Yield [%]	$M_n \times 10^{-3}$ [g mol^{-1}]	M_w/M_n	mm[c] [%]	mr[c] [%]	rr[c] [%]
tert-butyl acrylate									
2	25	2	95	85	25[a]	1.56	21	50	29
2	−30	18	79	98	30[a]	1.97	19	50	31
2	−30	18	201	90	38[a]	1.61	25	49	26
2	−30	18	309	38	38[a]	1.50	29	48	23
3a	−30	17	77	99	68[a]	1.62	25	45	30
4	25	3	181	11	13[a]	1.69	30	46	24
acrylonitrile									
2	25	16	328	24	3.3[b]		27	41	32
2	−30	48	198	48	5.0[b]		30	44	26
3a	−30	14	256	66	3.4[b]		26	43	31
4	25	24	185	24	–		30	41	29

[a] By gel permeation chromatography in THF, universal calibration relative to polystyrene standard. [b] By ^{1}H NMR spectroscopic end-group analysis. [c] mm, mr, and rr are iso-, hetero-, and syndiotactic triads, respectively.

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Experimental Section

2: To a solution of **1** (250 mg, 0.51 mmol), prepared from the reaction of $YCl_3(thf)_{3.5}$ and $LiCH_2SiMe_3$, in pentane (10 mL) was added a solution of $(C_5Me_4H)SiMe_2NHCMe_3$[3b] (128 mg, 0.51 mmol) in pentane (3 mL) at 0 °C. After the mixture was stirred at this temperature for 2 h, the solution was decanted and concentrated in vacuo. The crude product was recrystallized from pentane at −30 °C to give 233 mg (92 %) of **2** as colorless microcrystals. Complexes **3a**–**c** were prepared in a similar manner.

4: A solution of **2** (630 mg, 1.27 mmol) in pentane (10 mL) was loaded in a thick-walled 100-mL glass vessel. H_2 (4 atm) was charged at room temperature, and the reaction mixture was stirred vigorously. After 7 h of stirring, the solution above the white precipitate was decanted to provide 335 mg (64 %) of the colorless powder **4**.

Correct elemental analyses (C, H, N) were obtained for all compounds.

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[10] Complexes **3a** and **3b** can be hydrogenated in a similar fashion to yield a pentane-soluble complex with the probable formula $[(\eta^5\text{-}C_5Me_4SiMe_2X')YH_2]_4 \cdot 2\,thf$ (X′ = Me, Ph). A highly fluxional tetrameric structure is implied by the ^1H NMR spectrum, in which each hydride ligand couples to four yttrium atoms: K. C. Hultzsch, J. Okuda, unpublished results.

[11] a) Crystal size $0.70 \times 0.28 \times 0.15$ mm, monoclinic, space group $P2_1/n$ (no. 14), $Z = 4$; $a = 14.522(4)$, $b = 16.575(4)$, $c = 20.118(9)$ Å, $\beta = 110.65(3)^\circ$, $V = 4531(3)$ Å^3, $\rho_{calcd} = 1.206$ g cm^{-3}, $T = 293(2)$ K, $3 < \theta < 23^\circ$, ($\lambda(Mo_{K\alpha}) = 0.71070$ Å, $\mu = 2.631$ mm^{-1}); of 12823 reflections measured, 6266 were independent ($R_{int} = 0.1073$) and 3012 observed ($I > 2\sigma(I)$), Lorentz polarization and empirical absorption corrections (ψ scans), Patterson and Fourier syntheses (SHELXS-86 and SHELXL-93), 431 parameters, $R = 0.0509$, $wR_2 = 0.0933$, max./min. residual electron density 0.409/ − 0.384 e Å^{-3}. b) Crystallographic data (excluding structure factors) for the structure reported in this paper have been deposited with the Cambridge Crystallographic Data Centre as supplementary publication no. CCDC-410087. Copies of the data can be obtained free of charge on application to CCDC, 12 Union Road, Cambridge CB2 1EZ, UK (fax: (+44) 1223-336-033; e-mail: deposit@ccdc.cam.ac.uk).

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