Supporting Information

Supported Ni nanoparticles with phosphine ligand as efficient heterogeneous non-noble metal catalyst system for regioselective hydrosilylation of alkynes

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I. General information and experimental section

General Information:

XRD measurements were conducted by using a Smartlab-SE automated transmission diffractometer (STOE) equipped with an incident beam curved germanium monochromator with CuKa1 radiation and current of 40 kV and 150 mA, respectively. The XRD patterns were scanned in the 2 Theta range of 5-80 °. The X-ray diffraction (XRD) patterns of the as-prepared catalysts were obtained on a Rigaku B/Max-RB X-ray diffractometer with a nickel-filtrated Cu K a radiation operated at 40 kV and 40 mA. XPS were obtained using a Escalab 250Xi instrument equipped with monochromatic Al target and dual anode Al/Mg target X-ray sources, including large-area XPS, micro-area XPS and XPS parallel imaging. The electron binding energy was referenced to the C1s peak at 284.8 eV. The background pressure in the chamber was less than 10^{-7} Pa. The peaks were fitted by Gaussian-Lorentzian curves after a Shirley background subtraction. For quantitative analysis, the peak area was divided by the element-specific Scofield factor and the transmission function of the analyzer. The BET surface area measurements were performed on a Quantachrome IQ2 at the temperature of 77 K. The pore size distribution was calculated from the desorption isotherm by using the Barrett, Joyner, and Halenda (BJH) method. Prior to measurements, the samples were degassed at 300 °C for 3 h, at a rate of 10 °C•min⁻¹. Transmission electron microscope (TEM) was carried out on a FEI Tecnai G2 F20S-Twin using an accelerating voltage of 200 kV. For sample preparation, the powders were dispersed in ethanol with the assistance of sonication, and one drop of the solution was dropped onto a micro grid. NMR spectra were measured by using a Bruker ARX 400 or ARX 100 spectrometer at 400 MHz (1H) and 100 MHz (13C). Chemical shifts were reported in parts per million (ppm) down field from TMS with the solvent resonance as the internal standard. Coupling constants (J) were reported in Hz and refered to apparent peak multiplications.

Experimental Section:

All solvents and chemicals were obtained commercially and were used as received.

Typical procedure for preparation of Ni/Al₂O₃ catalyst

The Ni/Al₂O₃ catalysts were prepared as follows. In a typical preparation, Ni(NO₃)₂ 6H₂O (0.125 g, 0.43 mmol) and Al(NO₃)₃ 9H₂O (7.338 g, 19.57 mmol) were added to deionized water (100 mL) at room temperature and stirred until complete dissolution. Then, aqueous Na₂CO₃ (30 mL, 1.25 M) was added dropwise and the mixture was stirred for a further 5 h at room temperature. The reaction mixture was centrifuged and washed with water to remove the base until the pH value of the aqueous solution was \approx 7. Subsequently, the solid was dried at 100 °C in air for 5 h, calcined at 400 °C for 4 h, and then reduced under a hydrogen flow at 450 °C for 3.0 h. The resulting catalyst samples were denoted as 2.5 wt% Ni/Al₂O₃.

The procedure for 2.5 wt% Ni/Al₂O₃ catalyst treated with Xantphos

A mixture of 2.5 wt% Ni/Al₂O₃ (40 mg), xantphos (5.9 mg), and 1,4-dioxane (3 mL) were added to a 38 mL press tube and exchanged with Ar. The mixture was stirred at 100 °C for 3 h. Then the mixture was concentrated by rotary evaporator, and dried under vacuum at room temperature to afford the 2.5 wt% Ni/Al₂O₃ treated with xantphos.

Typical procedure for hydrosilylation of alkynes with silanes

A mixture of alkyne 1 (1.0 mmol), phenylsilane 2 (1.2 mmol), 2.5 wt% Ni/Al₂O₃ (40 mg), xantphos (1 mol%), and 1,4-dioxane (3 mL) were added to a 38 mL press tube and exchanged with Ar. The reaction mixture was stirred at 100 °C for 3 h. After the reaction finished, Ph₃CH was added to mixture for quantitative analysis by ¹H NMR. The regioselectivity was measured by ¹H NMR. Then the crude reaction mixture was filtered and filtrate was concentrated by rotary evaporator and purified by silica gel column chromatography (petroleum ether/ethyl acetate = 100/1-10/1) to afford the corresponding products **3**.

For each catalyst recycling, the 5 wt% Ni/Al₂O₃ catalyst was separated by centrifugation, washed with 1,4-dioxane (8 mLx3), diethyl ether (8 mLx2), dried under vacuum at room temperature and then reused for the next run.

The procedure for Hg poisoning experiment

A mixture of phenylacetylene (1.0 mmol), phenylsilane (1.2 mmol), 2.5 wt% Ni/Al₂O₃ (40 mg), xantphos (5.9 mg, 1 mol%), Ph₃CH (122 mg, 0.5 mmol), and 1,4-dioxane (3 mL) were added to a

38 mL press tube and exchanged with Ar. The reaction mixture was stirred at 100 °C for 20 min. The reaction mixture (~ 0.2 mL) was taken out from the glass tube for quantitative analysis by ¹H NMR. Then, 474 mg Hg metal (182 equiv.) was added into the reaction mixtures. Next, the reaction mixture was stirred at 100 °C for another 160 min. Then, the reaction mixture (~ 0.2 mL) was taken out from the glass tube for quantitative analysis by ¹H NMR.

Entry	Reaction time	NMR yield	Selectivity [(E)- β/α]
1	20 min	32%	91:9
2	another 160 min	31%	90:10

II. Characterization results of catalysts

Entry	Catalyst	Ni (wt%) ^[a]	$SA(m^2 g^{-1})^{[b]}$	APR (nm) ^[b]	$PV (cm^3 g^{-1})^{[b]}$
1	1.0 wt% Ni/Al ₂ O ₃	0.91	103.195	18.53	0.956
2	2.5 wt% Ni/Al ₂ O ₃	1.95	118.264	15.00	0.887
3	5.0 wt% Ni/Al ₂ O ₃	4.1	237.469	6.56	0.779
4	10 wt% Ni/Al ₂ O ₃	8.0	231.718	5.59	0.648
5	15 wt% Ni/Al ₂ O ₃	11.7	235.368	3.86	0.454
6	reused 5.0% Ni/Al ₂ O ₃	3.5			

Table S1 The physical properties of catalysts

a. Determined by ICP-AES. b. Determined by an IQ₂ automated gas sorption analyser. SA: BET surface area; APS: average pore radius; PV: pore volume.

Table S2	Ni contents in	the catalytic	solution after	: each cycle ^{<i>a</i>}
		2		

Entry	times	Ni (ppm/solution)
1	1 st	0.13
2	2 nd	0.19
3	3 rd	0.18

a. Determined by ICP-AES.

The nickel contents in the solution after each cycle were tested by ICP-AES. The nickel contents in the solution was only 0.13, 0.19 and 0.18 ppm with 5.0 wt%Ni/Al₂O₃ as catalyst at the 1^{st} , 2^{nd} and 3^{rd} runs.



Figure S1 TEM and HR-TEM images of the samples. (a), (b) 1.0 wt% Ni/Al₂O₃, (c), (d) 2.5 wt% Ni/Al₂O₃, (e), (f) 5.0 wt% Ni/Al₂O₃, (g), (h) 10.0 wt% Ni/Al₂O₃, (i), (j) 15.0 wt% Ni/Al₂O₃, (k), (l) reused 5.0 wt% Ni/Al₂O₃.



Figure S2 X-ray diffraction patterns of catalysts. (a) 1.0 wt% Ni/Al₂O₃, (b) 2.5 wt% Ni/Al₂O₃, (c) 5.0 wt% Ni/Al₂O₃, (d) 10.0 wt% Ni/Al₂O₃, (e) 15.0 wt% Ni/Al₂O₃, (f) reused 5.0 wt% Ni/Al₂O₃.



Figure S3 XPS spectra of catalysts. (a) 1.0 wt% Ni/Al₂O₃, (b) 2.5 wt% Ni/Al₂O₃, (c) 5.0 wt% Ni/Al₂O₃, (d) 10.0 wt% Ni/Al₂O₃, (e) 15.0 wt% Ni/Al₂O₃, (f) reused 5.0 wt% Ni/Al₂O₃.



Figure S4 XPS spectra of catalysts. (a) 2.5 wt% Ni/Al₂O₃, (b) 2.5 wt% Ni/Al₂O₃ treated with xantphos.



Figure S5 N₂ adsorption-desorption isotherm of samples. (a) 1.0 wt% Ni/Al₂O₃, (b) 2.5 wt% Ni/Al₂O₃, (c) 5.0 wt% Ni/Al₂O₃, (d) 10.0 wt% Ni/Al₂O₃, (e) 15.0 wt% Ni/Al₂O₃.

III. Optimization of the reaction conditions

DI		10 wt% Ni/Al ₂ O ₃ , 1 mol% ligand → toluene, 120 °C, 12 h		SiH_F	SiH ₂ Ph
Pn +	PhSiH ₃			Ph	Ph
1a	2a			3a (<i>E</i> –β)	4a (α)
Entry		Ligand	Yield ^b (%	.)	3 a/4a ^c (%)
1			0		
2		bpy	0		
3		1,10-Phen	0		
4		PPh ₃	17		59/41
5		dppe	9		78/22
6		dppb	12		67/33
7		binap	0		
8		xantphos	73		88/12
9		dppf	6		84/16
10		DPEphos	25		72/28
11^d		IPr·HCl	18		61/39

 Table S3
 The influence of ligand on catalytic performance ^a

a. Reaction conditions: phenylacetylene **1a** (1.0 mmol), phenylsilane **2a** (1.2 mmol), catalyst (40 mg), ligand (1 mol%), solvent (4.0 mL), 120 °C, 12 h; b. Yields of 3a, and 4a, determined by ¹H NMR using triphenylmethane as internal standard material; c. Determined by ¹H NMR using triphenylmethane as internal standard material; d. 2 mol% Bu^tOK was added.

Dh 4		Ni/Al ₂ O ₃ , 1 mol% xantphos		SiH ₂ Ph + I
FII — '	- FIISII13	toluene, 120 ^o C, 12 h	Ph ²	Ph
1a	2a		3a (<i>E</i> –	β) 4a (α)
Entry		Ni/Al ₂ O ₃ (wt%)	Yield ^b (%)	3 a/4a ^c (%)
1		1.0	71	85/15
2		2.5	75	88/12
3		5.0	76	87/13
4		15.0	78	87/13

Table S4 The influence of Ni loading in Ni/Al₂O₃ on catalytic performance ^a

a. Reaction conditions: phenylacetylene **1a** (1.0 mmol), phenylsilane **2a** (1.2 mmol), catalyst (40 mg), ligand (1 mol%), solvent (4.0 mL), 120 °C, 12 h; b. Yields of 3a, and 4a, determined by ¹H NMR using triphenylmethane as internal standard material; c. Determined by ¹H NMR using triphenylmethane as internal standard material.

DL —		2. 5 wt% Ni/Al ₂ 0	D ₃ , 1 mol% xantphos	🔊 SiHaPh	SiH ₂ Ph
$Ph \longrightarrow Ph SiH_3$		toluene, T ^o C, 12 h		Ph	+ Ph
1a	2a			3a (<i>Ε</i> –β)	4a (α)
Entry	7	T (°C)	Yield ^b (%)	3a/	/4a ^c (%)
1		60	0		
2		80	0		
3		100	82		89/11
4		140	58		83/17

 Table S5
 The influence of the temperature on catalytic performance^a

a. Reaction conditions: phenylacetylene **1a** (1.0 mmol), phenylsilane **2a** (1.2 mmol), catalyst (40 mg), ligand (1 mol%), solvent (4.0 mL), T °C, 12 h; b. Yields of 3a, and 4a, determined by ¹H NMR using triphenylmethane as internal standard material; c. Determined by ¹H NMR using triphenylmethane as internal standard material.

Table So The influence of the solvent on catalytic performance	Fable S6	The influence of the solvent on catalytic	performance
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DL		2.5 wt% Ni/Al ₂ O ₃ , 1 mol% xar	ntphos	SiH ₂ Ph
Pn——	+ PhSiH ₃	solvent, 100 °C, 12 h	Ph	Ph
1a	2a		3a (<i>E</i> –β)	4a (α)
Entry	y	Solvent	Yield ^b (%)	3 a/4a ^c (%)
1		THF	0	
2		1,4-Dioxane	85	89/11
3		Et ₂ O	81	89/11
4		Hexane	82	87/13

a. Reaction conditions: phenylacetylene **1a** (1.0 mmol), phenylsilane **2a** (1.2 mmol), catalyst (40 mg), xantphos (1 mol%), solvent (4.0 mL), 100 °C, 12 h; b. Yields of 3a, and 4a, determined by ¹H NMR using triphenylmethane as internal standard material; c. Determined by ¹H NMR using triphenylmethane as internal standard material.

Table S7 The influence of the time on catalytic performance	, a
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Dh — 4	DECILI	2.5 wt% Ni/Al ₂	O ₃ , 1 mol% xantphos	⇒ SiH₂Ph ı	SiH ₂ Ph
Pn	P151H3	1,4-dioxane, 100 °C, t h		Ph Ph	Ph
1a	2a			3a (<i>Ε</i> –β)	4a (α)
Entr	v	t (h)	Yield ^{<i>b</i>} (%)	3a/4	a^{c} (%)
1	v	0.5	56	90)/10
2		1.0	70	90)/10
3		3	84	90)/10
4		6	89	90)/10
5		9	81	90)/10

a. Reaction conditions: phenylacetylene **1a** (1.0 mmol), phenylsilane **2a** (1.2 mmol), catalyst (40 mg), Xantphos (1 mol%), dioxane (4.0 mL), 100 °C, t h; b. Yields of 3a, and 4a, determined by ¹H NMR using triphenylmethane as internal standard material; c. Determined by ¹H NMR using triphenylmethane as internal standard material.

Table S8Reusability testing of Ni/Al₂O₃ catalyst ^a



Entry	times	Yield	3a/4a (%)
1	1 st	83%	90:10
2	2 nd	84%	90:10
3	3 rd	82%	90:10

a. Reaction conditions: phenylacetylene **1a** (1.0 mmol), phenylsilane **2a** (1.2 mmol), catalyst (40 mg), Xantphos (1 mol%), dioxane (4.0 mL), 100 °C, 3 h; b. Yields of 3a, and 4a were determined by ¹H NMR using triphenylmethane as internal standard material. The product ratios [(E)- β/α] were determined by was determined by ¹H NMR spectra.

IV. Characterization data for products



(E)-Phenyl(styryl)silane (3a)¹

Colorless oil. ¹**H NMR** (400 MHz, CDCl₃) δ 4.74 (dd, $J_1 = 2.8$ Hz, $J_2 = 5.2$ Hz, 2H), 6.49 (dt, $J_1 = 3.4$ Hz, $J_2 = 19.2$ Hz, 1H), 7.19 (d, $J_1 = 3.2$ Hz, $J_2 = 18.8$ Hz, 1H), 7.33-7.47 (m, 2H), 7.50-7.53 (m, 6H), 7.67-7.70 (m, 2H); ¹³**C NMR (101 MHz, CDCl₃)** δ 149.29, 137.69, 135.46, 131.62, 129.80, 128.63, 128.58, 128.09, 126.66, 119.35.



(*E*)-(4-methoxystyryl)(phenyl)silane (3b)²

Colorless oil. ¹**H NMR** (400 MHz, CDCl₃) δ 3.86 (s, 3H), 4.73 (d, *J* = 3.2 Hz, 2H), 6.35 (dt, *J*₁ = 19.2 Hz, *J*₂ =3.4 Hz, 1H), 6.89-6.93 (m, 2H), 7.12 (d, *J* = 18.8 Hz, 1H), 7.38-7.47 (m, 5H), 7.66-7.68 (m, 2H); ¹³C NMR (101 MHz, CDCl₃) δ 160.01, 148.75, 135.44, 131.97, 130.72, 129.71, 128.04, 128.00, 116.27, 113.86, 55.29.



(E)-(4-Methylstyryl)(phenyl)silane (3c)¹

Colorless oil. ¹**H NMR** (400 MHz, CDCl₃) δ 2.40 (s, 3H), 4.74 (d, *J* = 3.6 Hz, 2H), 6.46 (dt, *J* = 18.8, 3.2 Hz, 1H), 7.16–7.21 (m, 3H), 7.39–7.47 (m, 5H), 7.66–7.69 (m, 2H); ¹³C NMR (101 MHz, CDCl₃) δ 149.23, 138.65, 135.46, 135.06, 131.83, 129.74, 129.29, 128.06, 126.60, 117.89, 21.28.



(E)-(3-Methylstyryl)(phenyl)silane (3d)¹

Colorless oil. ¹**H NMR** (400 MHz, CDCl₃) δ 2.39 (s, 3H), 4.72 (d, *J* = 3.2 Hz, 2H), 6.48 (dt, *J*₁ = 18.8 Hz, *J*₂ =3.2 Hz, 1H), 7.14-7.22 (m, 2H), 7.27-7.34 (m, 3H), 7.40-7.48 (m, 3H), 7.65-7.70 (m, 2H); ¹³C NMR (101 MHz, CDCl₃) δ 149.45, 138.16, 137.68, 135.47, 131.72, 129.78, 129.43, 128.49, 128.07, 127.38, 123.87, 119.04, 21.38.



(*E*)-(4-(tert-butyl)styryl)(phenyl)silane (3e)¹

Colorless oil. ¹H NMR (400 MHz, CDCl₃) δ 1.37 (s, 9H), 4.73 (d, J = 3.2 Hz, 2H), 6.48 (dt, $J_1 = 18.8$ Hz, $J_2 = 3.2$ Hz, 1H), 7.18 (d, J = 18.8 Hz, 1H), 7.37-7.47 (m, 7H), 7.66-7.68 (m, 2H); ¹³C NMR (101 MHz, CDCl₃) δ 151.87, 149.15, 135.46, 135.05, 131.84, 129.73, 128.05, 126.42, 125.52, 118.18, 34.67, 31.25.



(E)-(4-fluorostyryl)(phenyl)silane (3f)¹

Colorless oil. ¹**H NMR** (400 MHz, CDCl₃) δ 4.73 (d, 2H, *J* = 3.2 Hz), 6.43 (dt, *J*₁ = 18.8 Hz, *J*₂ =3.2 Hz, 1H), 7.07 (t, *J* = 17.6 Hz, 2H), 7.12 (d, *J* = 18.8 Hz, 1H), 7.41-7.49 (m, 5H), 7.65 (dd, *J*₁ = 7.6 Hz, *J*₂ =3.2 Hz, 2H); ¹³**C NMR (101 MHz, CDCl₃)** δ 115.53 (d, *J* = 21.2 Hz), 119.10 (d, *J* = 2.0 Hz), 128.11, 128.29 (d, *J*= 8.1 Hz), 129.85, 131.5, 133.97 (d, *J* = 4.0 Hz), 135.45, 147.90, 162.23 (d, *J*= 249.5 Hz); ¹⁹**F NMR** (368 MHz, CDCl₃) δ -112.77.



(E)-(4-Chlorostyryl)(phenyl)silane $(3g)^1$

Colorless oil. ¹H NMR (400 MHz, CDCl₃) δ 4.72-4.73 (m, 2H), 6.49-6.56 (m, 1H), 7.10 (d, *J* = 19.2 Hz, 1H), 7.31-7.35 (m, 2H), 7.41-7.47 (m, 5H), 7.65-7.67 (m, 2H); ¹³C NMR (101 MHz, CDCl₃) δ 147.78, 136.16, 135.46, 134.32, 131.31, 129.89, 128.77, 128.14, 127.86, 120.36.



(*E*)-(4-bromostyryl)(phenyl)silane (3h)²

Colorless oil. ¹**H NMR** (400 MHz, CDCl₃) δ 4.71 (d, *J* = 3.2 Hz, 2H), 6.50 (dt, *J*₁ = 18.8 Hz, *J*₂ = 3.2 Hz, 1H), 7.08 (d, *J* = 18.8 Hz, 1H), 7.33-7.37 (m, 2H), 7.39-7.46 (m, 3H), 7.49-7.51 (m, 2H), 7.64-7.66 (m, 2H); ¹³C NMR (101 MHz, CDCl₃) δ 147.84, 135.46, 133.53, 131.73, 131.28, 129.90, 128.15, 128.10, 122.59, 120.59.



(E)-phenyl(2-(thiophen-2-yl)vinyl)silane (3i)¹

Colorless oil. ¹**H NMR** (400 MHz, CDCl₃) δ 4.68 (d, *J* = 2.8 Hz, 2H), 6.23 (dt, *J*₁ = 18.8 Hz, *J*₂ =3.2 Hz, 1H), 6.99-7.04 (m, 2H), 7.21-7.26 (m, 2H), 7.39-7.45 (m, 3H), 7.63-7.65 (m, 2H); ¹³C NMR (101 MHz, CDCl₃) δ 144.33, 141.46, 135.47, 131.39, 129.84, 128.10, 127.54, 126.72, 125.77, 118.74.

(E)-Dec-1-en-1-yl(phenyl)silane (3j)¹

Colorless oil. ¹**H NMR** (400 MHz, CDCl₃) δ 0.89-0.91 (m, 3H), 1.29-1.45 (m, 12H), 2.17-2.22 (m, 2H), 4.54-4.56 (m, 2H), 5.71-5.76 (m, 1H), 6.35-6.42 (m, 1H), 7.36-7.39 (m, 3H), 7.58-7.60 (m, 2H); ¹³C NMR (101 MHz, CDCl₃) δ 154.22, 135.33, 132.38, 129.53, 127.95, 119.76, 36.95, 31.88, 29.45, 29.27, 29.18, 28.40, 22.68, 14.12.

(E)-oct-1-en-1-yl(phenyl)silane $(3k)^1$

Colorless oil. ¹H NMR (400 MHz, CDCl₃) & 0.89-0.91 (m, 3H), 1.30-1.44 (m, 8H), 2.19-2.21 (m,

2H), 4.55-4.56 (m, 2H), 5.71-5.76 (m, 1H), 6.34-6.42 (m, 1H), 7.36-7.42 (m, 3H), 7.58-7.60 (m, 2H); ¹³C NMR (101 MHz, CDCl₃) δ 154.22, 135.33, 132.38, 129.54, 127.95, 119.77, 36.95, 31.70, 28.84, 28.37, 22.61, 14.09.



(E)-hex-1-en-1-yl(phenyl)silane (3l)¹

Colorless oil. ¹**H NMR** (400 MHz, CDCl₃) δ 0.92 (t, *J* = 7.2 Hz, 3H), 1.28-1.46 (m, 4H), 2.18-2.23 (m, 2H), 4.54-4.55 (m, 2H), 5.71-5.76 (m, 1H), 6.35 (dt, *J*₁ = 18.4 Hz, *J*₂ = 6.2 Hz, 1H), 7.35-7.41 (m, 3H), 7.58-7.60 (m, 2H); ¹³**C NMR (101 MHz, CDCl₃)** δ 154.16, 135.32, 132.37, 129.54, 127.96, 119.78, 36.62, 30.56, 22.23, 13.94.



(E)-(3,3-dimethylbut-1-en-1-yl)(phenyl)silane (3m)¹

Colorless oil. ¹**H NMR** (400 MHz, CDCl₃) δ 1.05 (s, 9H), 4.55 (d, *J* = 3.2 Hz, 2H), 5.61-5.67 (m, 1H), 6.38 (d, *J* = 18.8 Hz, 1H), 7.36-7.41 (m, 3H), 7.57-7.59 (m, 2H); ¹³**C NMR (101 MHz, CDCl₃)** δ 164.12, 135.32, 132.51, 129.54, 127.96, 113.38, 35.76, 28.85.



(E)-(1,2-diphenylvinyl)(phenyl)silane (3n)³

White solid. ¹H NMR (400 MHz, CDCl₃) δ 4.84 (s, 2H), 7.05-7.16 (m, 8H), 7.21-7.31 (m, 3H), 7.37-7.45 (m, 3H), 7.59-7.63 (m, 2H); ¹³C NMR (101 MHz, CDCl₃) δ 142.26, 141.34, 138.49, 136.79, 135.69, 131.29, 129.86, 129.51, 128.74, 128.03, 127.96, 127.75, 127.57, 126.31.



(E)-dodec-6-en-6-yl(phenyl)silane (30)³

Colorless oil. ¹**H NMR** (400 MHz, CDCl₃) δ 0.85 (t, *J* = 6.6 Hz, 3H), 0.90 (t, *J* = 6.6 Hz, 3H), 1.24-1.41 (m, 14H), 2.15 (q, *J* = 7.5 Hz, 4H), 4.53 (s, 2H), 6.02 (t, *J* = 6.8 Hz, 1H), 7.34-7.40 (m, 3H), 7.56-7.58 (m, 2H); ¹³C NMR (101 MHz, CDCl₃) δ 146.27, 135.53, 134.03, 132.77, 129.43, 127.89, 31.84, 31.62, 30.29, 29.16, 29.02, 28.80, 22.56, 22.47, 14.05, 13.99.



(E)-Diphenyl(styryl)silane (3p)¹

Colorless oil. ¹**H NMR** (400 MHz, CDCl₃) δ 5.26 (s, 0.67H), 5.40 (s, 0.24H), 5.69–5.70 (m, 0.27H), 6.30 (s, 0.27H), 6.70–6.76 (m, 0.74H), 7.08 (d, *J* = 18.8 Hz, 1H), 7.22–7.25 (m, 0.43H), 7.27–7.31 (m, 1.14H), 7.33–7.44 (m, 7.84H), 7.47–7.49 (m, 1.74H), 7.57–7.59 (m, 1.11H), 7.63–7.65 (m, 2.89H); ¹³C NMR (101 MHz, CDCl₃) δ 149.09, 137.80, 135.51, 133.56, 129.76, 128.56, 128.38, 128.05, 126.71, 121.48.

V. NMR spectra of the products

































WHL-X191212-F-3























WHL-X191205-H-5













7,580 III 7,580 III 7,580 III 7,586 III 7,578 III 7,578























WHL-X200113-H-6



The ¹H NMR spectra for the selective hydrosilylations of phenylacetylene and styrene



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