Supporting Information

E-H Bond Activation Reactions (E = H, C, Si, Ge) at Ru: Terminal Phosphides, Silylenes, and Germylenes

Ayumi Takaoka, Arjun Mendiratta, Jonas C. Peters*

Massachusetts Institute of Technology

jcpeters@mit.edu

Contents

Figure S1. Fully labeled diagram of 9.

Figure S2. ¹H-²⁹Si HSQC spectrum of 9.

Table S1. Kinetic data for Eyring plot for the decay of 5.

Figure S3. Eyring plot for the decay of 5.

Figure S4. Typical decay behavior of 5 vs d_{30} -[SiP^{Ph}₃]Ru(PPh₂) at 35°C.

Figure S5. NMR spectra for 4.

Figure S6. NMR spectra for 5.

Figure S7. NMR spectra for 8.

Figure S8. NMR spectra for 9.

Figure S9. NMR spectra for 10b.

Figure S10. NMR spectra for 12.

Figure S11. NMR spectra for 13.



Figure S1. Fully labeled diagram of $[SiP^{Ph_3}]Ru(H)(\eta^2-H_2SiPh_2)$ (9) and co-crystallized solvent.

Figure S2. ¹H-²⁹Si HSQC spectrum of **13** of upfield peak in d⁸-THF.



δ/ppm

 Table S1. Kinetic data for Eyring plot.

т(к)		rate constant(/hr)
	298.2	0.0164(4)
	308.2	0.0463(15)
	318.2	0.138(4)
	328.2	0.393(17)







Figure S4. Typical decay behavior of 5 vs d_{30} -[SiP^{Ph}₃]Ru(PPh₂) at 35°C.

Blue: **5** Pink: *d*₃₀-[**SiP**^{Ph}₃]**Ru(PPh**₂)



9 8 7 6 5 4 3 2 1 ppm



 $^{31}P{^{1}H}$ at -80 °C in d_{8} -THF.



³¹P{¹H} at RT in d_8 -THF.



Figure S6. NMR spectra for **5**. ¹H at RT in C_6D_6 .



 $^{31}P\{^1H\}$ at RT in C₆D₆.









 $^{31}P{}^{1}H$ at RT in C₆D₆.



Figure S8. NMR spectra for **9**. ¹H at -20 °C in d_8 -THF.



 1 H at RT in C₆D₆.



 $^{13}\mathrm{C}\{^{1}\mathrm{H}\}$ at RT in C₆D₆.





 $^{29}Si\{^1H\}$ at RT in C₆D₆.















Figure S11. NMR spectra for **13**. ¹H at RT in d_8 -THF.



²⁹Si{¹H} at RT in d_8 -THF.



Alexandric parts and a	and the state of the	اف العدمة المعقوم عن عالم الم	and and the second states of the second	القام بر هذه له. قام بالقاحر.	La stal brug a tribe sec	the states of the state of the state	et, Lane, by not the late of the	Using the second states of the second	ما سام مند عادر رمعاند
								i l l l l l l l l l l l l l l l l l l l	
120	110	100	90	80	70	60	50	40	30 ppm