

of optimum minimal energy, with transformation between this geometry and that with  $\theta$   $60^\circ$  requiring an energy change of  $10 \text{ kJ mol}^{-1}$ . It is not surprising, therefore, that variable temperature  $^{13}\text{C}\{-^1\text{H}\}$  NMR studies [1d] reveal that **10** adopts the symmetrical structure even at  $-80^\circ\text{C}$ .

- 9 Selected spectroscopic data: Compound **12**,  $\nu_{\text{max}}(\text{CO})$  1762 and  $1634 \text{ cm}^{-1}$  (thf). NMR:  $^1\text{H}$ ,  $\delta$   $-21.60$  (d of d, 2 H,  $\mu\text{-H}$ ,  $J(\text{RhC})$  28 and 20 Hz), 1.73 (s, 30 H,  $\text{C}_5\text{Me}_5$ ), and 1.83 (s, 15 H,  $\text{C}_5\text{Me}_5$ );  $^{13}\text{C}\{-^1\text{H}\}$ ,  $\delta$  245.2 (d of t,  $\mu_3\text{-CO}$ ,  $J(\text{RhC})$  39 and 26 Hz), 237.5 (t,  $\mu\text{-CO}$ ,  $J(\text{RhC})$  41 Hz), 101.7 ( $\text{C}_5\text{Me}_5$ ), 98.5 (d,  $\text{C}_5\text{Me}_5$ ,  $J(\text{RhC})$  6 Hz), 11.1 ( $\text{C}_5\text{Me}_5$ ), and 9.6 ppm ( $\text{C}_5\text{Me}_5$ ). Compound **13a**, NMR:  $^1\text{H}$ ,  $\delta$   $-25.54$  (d, 2 H,  $J(\text{RhH})$  32 Hz), 1.69 (s, 30 H,  $\text{C}_5\text{Me}_5$ ), and 1.80 (s, 15 H,  $\text{C}_5\text{Me}_5$ ). Compound **13b**, NMR:  $^1\text{H}$ ,  $\delta$   $-26.33$  (d, 1 H,  $\mu\text{-HCoRh}$ ,  $J(\text{RhH})$  20.8 Hz),  $-22.90$  (d of d, 1 H,  $\mu\text{-HRh}_2$ ,  $J(\text{RhH})$  31 and 21 Hz), 1.60 (s, 15 H,  $\text{C}_5\text{Me}_5$ ), 1.71 (s, 15 H,  $\text{C}_5\text{Me}_5$ ), and 1.80 (s, 15 H,  $\text{C}_5\text{Me}_5$ ). Compound **14a**, NMR:  $^1\text{H}$ ,  $\delta$   $-21.67$  (d, 2 H,  $\mu\text{-HIrRh}$ ,  $J(\text{RhH})$  27 Hz), 1.88 (br, 15 H,  $\text{C}_5\text{Me}_5$ ), and 1.76 (s, 30 H,  $\text{C}_5\text{Me}_5$ ); Compound **14b**, NMR:  $^1\text{H}$ ,  $\delta$   $-22.4$  (d, 1 H,  $\mu\text{-HIrRh}$ ,  $J(\text{RhH})$  21 Hz),  $-21.21$  (d of d, 1 H,  $\mu\text{-HRh}_2$ ,  $J(\text{RhH})$  32 and 21 Hz), 1.88 (br, 15 H,  $\text{C}_5\text{Me}_5$ ), 1.78 (s, 15 H,  $\text{C}_5\text{Me}_5$ ), and 1.77 (s, 15 H,  $\text{C}_5\text{Me}_5$ ).

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