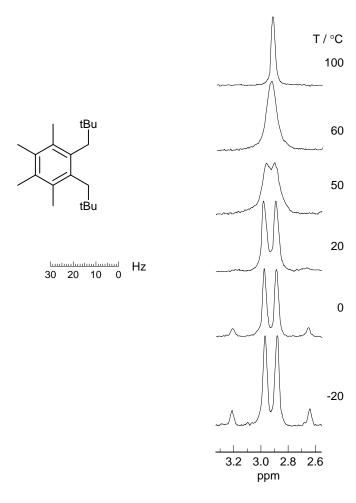
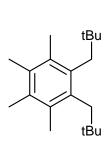
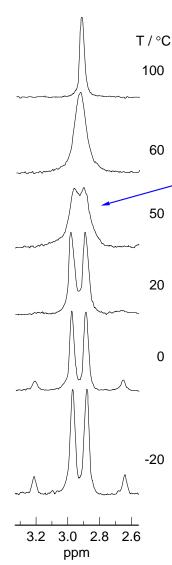
**Problem R-03N** ( $C_{20}H_{34}$ ): Interpret the 60 MHz variable temperature  $^1H$  NMR spectrum of 1,2-dineopentyl-3,4,5,6-tetramethylbenzene in  $CCl_4$ . Source: Dix, D. T.; Fraenkel, G.; Karnes, H. A.; Newman, M. S. *Tetrahedron Lett.* **1966**, 517



## **Problem Set 13**

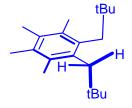
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*k* is approximately 31/sec at this temperature

The protons broaden and coalesce as the rotation rate increases



When rotation is slow around the Ar-CH<sub>2</sub> bond, the benzyl protons become disatereotopic.