

## 磷化氢与环烯烃反应的原位<sup>31</sup>P NMR研究

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**摘要** 本文应用加压原位核磁共振波谱技术,在反应温度50-70℃、反应压力1.0-2.0MPa,氘代苯为溶剂,偶氮二异丁腈为引发剂的条件下,考察了磷化氢与环烯烃1,5-环辛二烯、双环戊二烯、1,3-环己二烯、1,4-环己二烯及1,5,9-环十二三烯的反应。实验结果表明,磷化氢与1,5-环辛二烯反应主要生成双环磷杂环壬烷;与其它环烯烃均不生成磷杂环化合物,仅为—取代伯磷或二取代仲磷产物。磷化氢与环烯烃反应仍为串行机理。

**关键词** [环烯烃](#) [磷化氢](#) [偶氮二异丁腈](#) [氘代苯](#) [原位核磁](#)

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### In situ <sup>31</sup>P NMR study on the reaction of cyclic olefins with phosphine

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**Abstract** Under the following reaction conditions: temperature 50-70℃, pressure 1.0-2.0MPa, solvent C<sub>6</sub>D<sub>6</sub>, initiator AIBN, the reactions of 1,5-cyclooctadiene, dicyclopentadiene, 1,3-cyclohexadiene, 1,4-cyclohexadiene and 1,5,9-cyclododecatriene with PH<sub>3</sub> were studied by using the pressurized in-situ NMR technique. Experimental results indicated that the bicyclic phosphonane was formed by the addition of PH<sub>3</sub> to 1,5-cyclooctadiene. On the other hand, the heterocyclic compounds containing phosphorus could not be obtained in the reaction of PH<sub>3</sub> with other three cyclic olefins, primary phosphines being the only products observed. The results also indicated that the reaction of PH<sub>3</sub> with cyclic olefins proceeded with a sequential mechanism.

**Key words** [CYCLOALKENE](#) [PHOSPHOROUS HYDRIDE](#) [AZOBISISOBUTYRONITRILE \(AIBN\)](#)

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