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A Retro Diels–Alder Route to Diphosphorus Chemistry: Molecular Precursor Synthesis, Kinetics of P₂ Transfer to 1,3-Dienes, and Detection of P₂ by Molecular Beam Mass Spectrometry  

Pass the P₂

**Significance:** Cummins and co-workers have developed a novel system for thermally transferring the diphosphorus molecule P₂ from a transannular diphosphorus bisanthracene adduct 4 to various 1,3-dienes via a retro-Diels–Alder reaction.

**Comment:** Treatment of 4 with platinum ethylene complex [(C₂H₄)₂Pt(PPh₃)₂] at room temperature furnishes the expected platinum diphosphorus complex (P₂)[Pt(PPh₃)₂]₂, broadening the scope of this P₂ precursor to inorganic complexes.

**Trapping reactions:**

<table>
<thead>
<tr>
<th>Reaction</th>
<th>Product</th>
<th>Yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>MgC₄H₁₀·3THF</td>
<td>Me₂NPCl₂, THF, –78 °C</td>
<td>50% yield</td>
</tr>
<tr>
<td></td>
<td>HCl (2 equiv)</td>
<td>28–35% yield</td>
</tr>
<tr>
<td></td>
<td>LiAIH₄, THF, thawing to r.t.</td>
<td>86% yield</td>
</tr>
</tbody>
</table>

**Key words**
- retro-Diels–Alder reaction
- phosphorus
- fused ring systems