**Molybdenum Complex Catalyzed Z-Selective Cross-Metathesis**

**Significance:** Cross-metathesis with alkenyl halides is a highly challenging problem. The authors have developed a molybdenum alkylidene species that reacts with alkenyl halides to afford various bromo-, chloro-, or fluoroalkenes with high Z-selectivities. The synthesis of biologically active compounds is also demonstrated.

**Comment:** Commercially available (Z)-1-bromo-2-fluoroethene can be used as a fluoride source, instead of vinyl fluoride or (Z)-1,2-difluoroethene, which are difficult to handle. The authors suggest that, for steric and electronic reasons, the reaction with (Z)-1-bromo-2-fluoroethene proceeds through intermediate I.

**Selected examples:**

<table>
<thead>
<tr>
<th>Reaction</th>
<th>Yield</th>
<th>Selectivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>TBSO</td>
<td>80%</td>
<td>(Z)/E = 98:2</td>
</tr>
<tr>
<td>TBSO</td>
<td>63%</td>
<td>(Z)/E = 88:12</td>
</tr>
<tr>
<td></td>
<td>64% (fluoride)</td>
<td>F/Br = 96:4, (Z)/E = 97:3</td>
</tr>
<tr>
<td></td>
<td>80% (fluoride)</td>
<td>F/Br &gt; 98:2, (Z)/E &gt; 98:2</td>
</tr>
</tbody>
</table>

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