Palladium-Catalyzed Reductive Heck Reaction

**Significance:** Water represents the cheapest and most environmentally benign source of hydrogen or hydride; therefore, its use in combination with transition-metal catalysis is very appealing. In the present work, the authors present a palladium-catalyzed enantioselective reductive Heck reaction using water as final hydride donor.

**Comment:** N-Aryl acrylamides reacted in the presence of a [PdCl₂(MeCN)₂] catalyst and (S)-t-BuPHOX ligand to generate the corresponding products in good yields and good enantioselectivities using water as hydride source. The use of DABCO as a base and a catalytic amount of B₂(OH)₄ was found to be crucial for the success of the transformation. The use of deuterium oxide allowed the synthesis of D-labeled oxindoles with >90% D incorporation.

**Selected examples:**

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<th>R¹</th>
<th>R²</th>
<th>R³</th>
<th>OTf</th>
<th>[PdCl₂(MeCN)₂] (10.0 mol%)</th>
<th>ligand (20.0 mol%)</th>
<th>B₂(OH)₄ (2.0 equiv)</th>
<th>H₂O (2.0 equiv)</th>
<th>DABCO (4.0 equiv)</th>
<th>MeCN, 80 °C, 14 h (0.1 mmol scale)</th>
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**Reactions performed with D₂O and B₂Cat₂:**

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