Ruthenium-Catalyzed Dehydrative Benzofuran Synthesis via C–H Activation

Significance: Reported is the ruthenium-catalyzed dehydrative ortho-functionalization of phenols 1 with diols 2 affording benzofurans 4. When simple alcohols were employed, only ortho-functionalized phenols were obtained (not shown). When diols 2 were employed, the cyclized benzofurans 4 were the preferred products. Inclusion of an excess of a simple alkene (cyclopentene) promoted the coupling reaction. An impressive array of substrates were shown to undergo the transformation (4a–x), including more complex diols (4u) and structurally elaborate phenols (4s, 4v, 4w). A cursory investigation of the reaction mechanism is also reported.

Comment: The present report represents a highly convenient and robust method for the synthesis of substituted benzofurans, which are medicinally relevant heterocycles with a diverse range of biological activities (see Review below). The sheer scope and high yields of the reported process appear to make this method highly attractive for the synthesis of 2-substituted benzofurans. It would be interesting to know if the process performed as well on scale (10 g and above) as it does on more standard quantities (1 mmol).