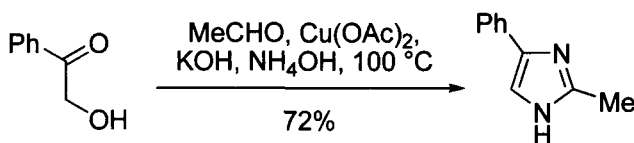
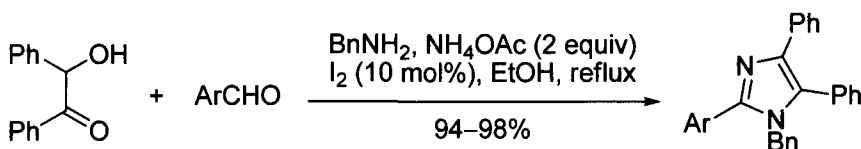


### 8.3.2 Weidenhagen

This is the reaction of an  $\alpha$ -hydroxy or acetoxy-ketone with  $\text{NH}_3$  and an aldehyde to provide a 2,4-di-substituted imidazole.



An improvement on this reaction has been described using catalytic iodine.<sup>19</sup> Several 1,2,4,5-tetra-substituted imidazoles were prepared in excellent yields.



Use of thiourea for this condensation is another variation for this reaction providing 2-thio-substituted imidazoles. Typically, the reaction is promoted thermally. Another classic method to generate 2-thio-imidazoles is the condensation of protected glycine with formate, followed by reaction with thiocyanide to form the imidazole.<sup>20</sup> In this instance, the 2-thio-3-carboxylate was isolated in 63% overall yield.

