Answer on question # 74570

Zinc in acetic acid is capable of a wide range of reduction reactions. Although many of these can also be performed by a great number of other reagents, this reagent is of particular value in that good chemoselectivities can often be achieved. Some such instances are noted in the text and equations below; many of the references have also been chosen to demonstrate selective reduction in sensitive, polyfunctional molecules

the partial reduction of pyrrole is difficult as the high electron density of these aromatic heterocycles inhibits the addition of an electron, the first step of a Birch reaction. Donohoe has shown that the partial reduction of pyrroles is possible but this process generally requires the presence of at least two electron withdrawing groups that reduce the electron density of the heterocycle such that reasonable yields of the 3-pyrrolines are obtained.

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