The present invention relates to the synthesis of ivabradine of formula (I):

$$H_3CO$$
 OCH_3
 OCH_3
 OCH_3
 OCH_3

Ivabradine is prepared by catalytic reductive amination of the compound (V) with the amine (VI) under hydrogen pressure in an organic solvent and, optionally, in the presence of trimethylamine *N*-oxide:

$$H_3CO$$
 H_3CO
 OCH_3
 OCH_3
 OCH_3
 OCH_3

Metallorganic compounds based on iron, cyclopentadiene and carbon monoxide derivatives are used as catalyst. The proposed process allows of excluding the use of catalysts based on precious metals, such as palladium, in the synthesis of ivabradine.

Claims: 14