A number of methods for the preparation of β-phenylethylamines are available in the literature. These may be broadly classified as follows:

1. Reduction of benzyl cyanide, oximes or w-nitrostyrenes.
2. Degradation of acids or acid amides by Schmidt or Hoffmann reaction.
3. Miscellaneous methods.

1. Reductive methods:

Reduction of nitriles, oximes or w-nitrostyrenes has been carried out chemically, by catalytic hydrogenation, or by electrolytic reduction.

a) Chemical reduction methods: Nitriles, oximes or nitrostyrenes have been reduced with a variety of reagents to the corresponding amines. Zinc and mineral acids\(^1,\)\(^2\), sodium in amyl alcohol or ethanol\(^3-5\), zinc nickel couple\(^6\), sodium amalgam in acetic acid\(^7\) and benzenesulphonyl chloride\(^8\) are the reagents employed for the reduction of benzyl cyanide. Reduction of oximes is carried out by sodium amalgam in acetic acid or by dropping oxime in acetic acid to a solution of methanol-sulphuric acid\(^9\). Aluminium amalgam or zinc dust with glacial acetic acid, or iron and hydrochloric acid are also used for the reduction of w-nitrostyrenes\(^10-12\). Lithium aluminium
hydride has been extensively used for the reduction of nitriles\textsuperscript{13-15}.

b) Catalytic reduction: Hydrogenation of oximes, nitriles and nitrostyrenes has been successfully carried out in the presence of a variety of catalysts. Raney nickel in methanol or ethanol saturated with ammonia\textsuperscript{16,17}, liquid ammonia\textsuperscript{1}, ten per cent tetralin\textsuperscript{18} has been used for the reduction of \( \alpha \)-nitrostyrenes or nitriles.

Palladiumcarbon in ethanol, hydrochloric acid\textsuperscript{19}, acetic acid-sulphuric acid\textsuperscript{20}, or pyridine\textsuperscript{21} was used for the reduction of oximes and nitriles. Good results were obtained when solution of oximes in acetic acid was added drop by drop to a suspension of Adam's catalyst in acetic acid-sulphuric acid in the reduction chamber\textsuperscript{9}. Urushibara nickel catalyst (U-Ni-NH\textsubscript{3}) and Urushibara cobalt catalyst (U-CO-B) have also been used for such reductions\textsuperscript{22}.

Electrolytic reduction:

Benzyl cyanide has been reduced to \( \beta \)-phenylethylamine when alkalin or acid solution is placed in cathode compartment of an electrolytic cell\textsuperscript{23}. \( \alpha \)-Nitrostyrenes have also been electrolytically reduced\textsuperscript{24}.

\( \alpha \)-Degradation of Acid or Amides:

a) Schmidt reaction: A good yield of \( \beta \)-phenylethylamine is obtained by Schmidt reaction of phenylpropionic
acid. The acid is converted to its azide by reaction of hydrazoic acid liberated in situ from sodium azide and sulphuric acid in benzene or chloroform solution.

b) Hoffmann reaction: This method has been extensively used for the preparation of β-phenylethlamines from corresponding amides using alkali hypochlorite or hypobromite. In the preparation of alkoxy substituted β-phenylethlamines, this method has been found to be most suitable and has been extensively used.

Miscellaneous methods:

β-phenylethlamines have also been prepared by methods not commonly employed for preparative purposes. Direct introduction of 2-aminoethyl group in the benzene nucleus was effected with ethyleneimine in the presence of AlCl₃. Various primary amines were obtained by condensing O-methyl-hydroxylamine (MeOMH₂) with alkylmagnesium chloride in ether. Dry distillation of alanine resulted in the formation of β-phenylethlamine. Condensation of phenylethyl chloride with hexamethylenetetramine in ethanol and then treatment with hydrochloric acid gave β-phenylethlamine hydrochloride from which amine is generated by addition of alkali solution.