Claims

1. Trans N-{4-{2-[4-(2,3-dichlorophenyl)-piperazine-1-il]-ethyl}-cyclohexylamine dihydrochloride monohydrate.

2. Process for the preparation of trans N-{4-{2-[4-(2,3-dichlorophenyl)-piperazine-1-il]-ethyl}-cyclohexylamine dihydrochloride monohydrate characterized in that

a) reacting trans 2-{1-[4-(N-tert-butoxycarbonyl)amino]-cyclohexyl}-acetic acid ester with sodium borohydride and aluminium trichloride to give trans 2-{1-[4-(N-tert-butoxycarbonyl)-amino]-cyclohexyl}-ethanol;

b) reacting trans 2-{1-[4-(N-tert-butoxycarbonyl)-amino]cyclohexyl}-ethanol obtained with methanesulfonic acid chloride in the presence of an acid binding agent to give trans 2-{1-[4-(N-tert-butoxycarbonyl)-amino]-cyclohexyl}-ethyl methanesulfonate;

c) reacting trans 2-{1-[4-(N-tert-butoxycarbonyl)-amino]-cyclohexyl}-ethyl methanesulfonate obtained with 2,3-dichlorophenyl-piperazine in the presence of an acid binding agent to give trans 2-{1-[4-(N-tert-butoxycarbonyl)-amino]-cyclohexyl}-carbamic acid tert-butylester;

d) heating trans 2-{1-[4-(N-tert-butoxycarbonyl)-amino]-cyclohexyl}-carbamic acid tert-butylester obtained to a temperature between 40-100°C in a mixture of aqueous hydrochloric acid/methanol to give trans N-{4-{2-[4-(2,3-dichlorophenyl)piperazine-1-il]-ethyl}-cyclohexylamine dihydrochloride monohydrate.

3. A process according to claim 2 characterized in that the steps a) and b) are carried out without isolation of the intermediate compounds obtained.

4. A process according to claim 2 characterized in that in step b) organic amines are employed as acid binding agent.

5. A process according to claim 4 characterized in that in step b) triethylamine is employed as acid binding agent.

6. A process according to claim 2 characterized in that in step c) an alkali carbonate is employed as acid binding agent.

7. A process according to claim 2 characterized in that in step d) heating is made at a temperature between 45-50°C.

Claims

1. Trans N-4-{2-[4-(2,3-dichlorophenyl)-piperazine-1-il]-ethyl}-cyclohexylamine dihydrochloride monohydrate.

2. A process for the preparation of trans N-4-{2-[4-(2,3-dichlorophenyl)-piperazine-1-il]-ethyl}-cyclohexylamine dihydrochloride monohydrate comprising

a) reacting trans 2-{1-[4-(N-tert-butoxycarbonyl)amino]-cyclohexyl}-acetic acid ester with sodium borohydride and aluminium trichloride to give trans 2-{1-[4-(N-tert-butoxycarbonyl)-amino]-cyclohexyl}-ethanol;

b) reacting trans 2-{1-[4-(N-tert-butoxycarbonyl)-amino]cyclohexyl}-ethanol obtained with methanesulfonic acid chloride in the presence of an acid binding agent to give trans 2-{1-[4-(N-tert-butoxycarbonyl)-amino]-cyclohexyl}-ethyl methanesulfonate;

c) reacting trans 2-{1-[4-(N-tert-butoxycarbonyl)-amino]-cyclohexyl}-ethyl methanesulfonate obtained with 2,3-dichlorophenyl-piperazine in the presence of an acid binding agent to give trans N-tert-butoxycarbonyl-4-{2-[4-(2,3-dichlorophenyl)piperazine-1-yl]-ethyl}-cyclohexylamine; and

d) heating trans N-tert-butoxycarbonyl-4-{2-[4-(2,3-dichlorophenyl)piperazine-1-yl]-ethyl}-cyclohexylamine obtained to a temperature between 40-100°C in a mixture of aqueous hydrochloric acid/methanol to give trans N-4-{2-[4-(2,3-dichlorophenyl)piperazine-1-yl]-ethyl}-cyclohexylamine dihydrochloride monohydrate.

3. The process according to claim 2 characterized in that the steps a) and b) are carried out without isolation of the intermediate compounds obtained.

4. The process according to claim 2 characterized in that in step b) organic amines are employed as acid binding agent.

5. The process according to claim 4 characterized in that in step b) triethylamine is employed as acid binding agent.

6. The process according to claim 2 characterized in that in step c) an alkali carbonate is employed as acid binding agent.

7. The process according to claim 2 characterized in that in step d) heating is made at a temperature between 45-50°C.