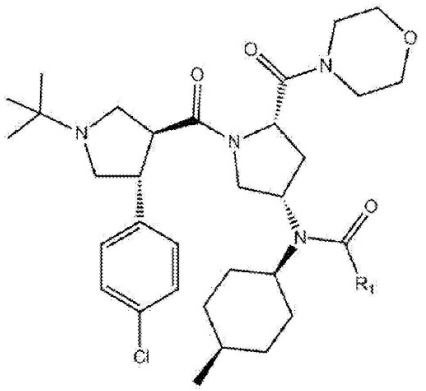
CLAIMS

1. An amorphous compound of the following formula 1, or a pharmaceutically acceptable salt thereof:

[Formula 1]



wherein R_1 is C_2-C_5 alkyl.

2. The compound or the pharmaceutically acceptable salt thereof of claim 1, having the X-ray diffraction pattern shown in FIG. 1.

3. The compound or the pharmaceutically acceptable salt thereof of claim 1, having the DSC profile shown in FIG. 2.

4. The compound or the pharmaceutically acceptable salt thereof of claim 1, having the TGA profile shown in FIG. 3.

5. The compound or the pharmaceutically acceptable salt

thereof of claim 1, wherein the pharmaceutically acceptable salt of the compound of formula 1 is selected from the group consisting of: hydrochloric acid, sulfuric acid, nitric acid, phosphoric acid, hydrobromic acid, and hydroiodic acid, of the compound.

6. The compound or the pharmaceutically acceptable salt thereof of claim 1, which is *N*-((3*S*,5*S*)-1-((3*S*,4*R*)-1-(*tert*-butyl)-4-(4-chlorophenyl)pyrrolidine-3-carbonyl)-5-(morpholine-4-carbonyl)pyrrolidin-3-yl)-*N*-((1*s*,4*R*)-4-methylcyclohexyl)isobutyramide hydrochloride.

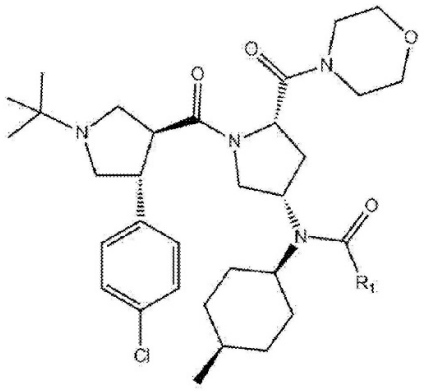
7. A method for preparing the amorphous compound or the pharmaceutically acceptable salt thereof described in any one of claims 1-6, the method comprising the steps of:

preparing a mixed solution by dissolving the compound represented by the following formula 1 in an organic solvent;

cooling the mixed solution; and

adding an acid to the cooled mixed solution dropwise:

[Formula 1]



wherein R_1 is C_2-C_5 alkyl.

8. The preparation method of claim 7, wherein the organic solvent includes an ether-based organic solvent.

9. The preparation method of claim 7, further comprising a step for adding a non-polar organic solvent to the mixed solution before, after, or simultaneously with cooling the mixed solution.

10. A pharmaceutical composition comprising the compound according to any one of claims 1-6 and a pharmaceutically acceptable carrier.

11. A pharmaceutical composition for use in agonizing the function of a melanocortin-4 receptor, the composition comprising the compound according to any one of claims 1-6 and a pharmaceutically acceptable carrier.

12. The pharmaceutical composition of claim 11 for use in preventing or treating obesity, diabetes, inflammation, or erectile dysfunction.

13. Use of the pharmaceutical composition of claim 11 in the manufacture of a medicament for preventing or treating obesity, diabetes, inflammation, or erectile dysfunction.

14. The amorphorous compound or the pharmaceutically acceptable salt thereof according to any one of claims 1-6 for use in preventing or treating obesity, diabetes, inflammation, or erectile dysfunction.

15. Use of the amorphorous compound or the pharmaceutically acceptable salt thereof according to any one of claims 1-6 in the manufacture of a medicament for preventing or treating obesity, diabetes, inflammation, or erectile dysfunction.