CLAIMS

1. A process for preparing a quercetin-hexahydric alcohol cocrystal as a bioenhancer for improving the absorption and the bioavailability of bioactive compounds, the process comprising a formation of the cocrystal from a quercetin and a hexahydric alcohol by a kinetic-controlled cocrystallization process, wherein the kinetic-controlled cocrystallization process comprises forming the cocrystal by cooling a solution containing the quercetin and the hexahydric alcohol at a cooling rate of 10 – 20 °C/min, and wherein the hexahydric alcohol is sorbitol.

2. The process according to claim 1, wherein said solution containing the quercetin and the hexahydric alcohol and having the temperature before said cooling in the range of 40 – 70 °C

3. The process according to claim 2, further comprises a step of aging the cocrystal.

4. The process according to claim 2, wherein the solution comprises a solvent that is selected from the group consisting of methanol, ethanol, and a combination thereof.

5. The process according to claim 4, wherein the quercetin is a quercetin dihydrate.

6. The process according to claim 5, wherein a diffusion coefficient of the quercetin dihydrate in the solvent is at 5×10^{-10} m²/s.

7. The process according to claim 1, wherein a diffusion coefficient of the hexahydric alcohol in the solvent is at 8×10^{-10} m²/s.

8. The process according to claim 2, wherein a molar ratio of the quercetin to the hexahydric alcohol in the solution is in the range of 1:1.

9. The process according to claim 8, wherein the solution containing the quercetin and the hexahydric alcohol has the temperature before said cooling in the range of 40 – 70 °C, and wherein the kinetic-controlled cocrystallization process has a kinetic constant (k) in the

range of 1 x 10^{-16} – 1 x 10^{-14} m^3/s, wherein the kinetic constant (K) is defined by the following equation $K = J \times G^3$, wherein J is the nucleation rate of the co-crystal and G is the growth rate of the co-crystal as defined in the description.

10. The process according to claim 9, wherein the kinetic-controlled cocrystallization process has the kinetic constant (k) at 10^{-15} m^3/s.

11. The process according to claim 1, wherein the bioactive compound is selected from the group consisting of an active pharmaceutical ingredient, a vitamin, a natural bioactive, a phytochemical, a mineral, and any combination thereof.

12. A quercetin-hexahydric alcohol cocrystal as a bioenhancer for improving the absorption and the bioavailability of a bioactive compound a bioactive compound, wherein the hexahydric alcohol is sorbitol and wherein said cocrystal has a molar ratio of a quercetin to a hexahydric alcohol of 1:1.

13. The quercetin-hexahydric alcohol cocrystal according to claim 12, characterized by at least one of the following XRPD peaks: 10.7, 12.4, 13.8, 13.9, 14.7, 16.2, 16.4, 17.7, 18.0, 19.3, 21.6, 23.8, 25.9, 27.2, 28.7, 29.8, 33.5, 35.8, 36.6, and 37.0 ± degree 2-theta [Cu Kα radiation (λ = 1.5406 Å)].

14. The quercetin-hexahydric alcohol cocrystal according to claim 13, said cocrystal exhibits a thermal gravimetric in the range of 338.58 – 342.2 °C determined by differential scanning calorimetry with a heating rate of 10 ºC / min.

15. The quercetin-hexahydric alcohol cocrystal according to claim 14, wherein the bioactive compound is selected from the group consisting of an active pharmaceutical ingredient, a vitamin, a natural bioactive, a phytochemical, a mineral, and any combination thereof.

16. A pharmaceutical composition comprising the quercetin-hexahydric alcohol cocrystal according to claim 12 and at least one pharmaceutically acceptable carrier.

17. The pharmaceutical composition according to claim 16 for use in enhancing cell permeability and bioavailability of the bioactive compound.

18. The pharmaceutical composition according to claim 16 for use in the treatment of inflammation.