Claims

1. A sterile liquid pharmaceutical formulation comprising phenylephrine, ketorolac and a buffer system in an aqueous carrier, wherein the formulation is preservative-free and antioxidant-free and is stable for at least six months when stored at a temperature of from 5+/-3°C to 25+/-2°C.

2. The pharmaceutical formulation of claim 1, wherein the buffer system is selected from a sodium phosphate buffer system and a sodium citrate buffer system.

3. The pharmaceutical formulation of claim 2, wherein the buffer system comprises an about 20 mM sodium citrate buffer system.

4. The pharmaceutical formulation of claim 1, wherein the pharmaceutical formulation has a pH of from 5.8 to 6.8.

5. The pharmaceutical formulation of claim 1, wherein formulation is stable for a period of at least 24 months when stored at a temperature of from 5+/-3°C to 25+/-2°C.

6. The pharmaceutical formulation of claim 1, wherein the formulation is contained within a single-use container.

7. The pharmaceutical formulation of claim 1, wherein the formulation comprises from 46 to 76 mM phenylephrine and from 8.5 to 14 mM ketorolac.

8. The pharmaceutical formulation of claim 7, wherein the formulation comprises about 60.75 mM phenylephrine and about 11.25 mM ketorolac.

9. The pharmaceutical formulation of claim 1, further comprising an intraocular irrigation carrier into which the formulation is injected, wherein after injection the phenylephrine is present at a concentration of from 30 to 720 μM and the ketorolac is present at a concentration of from 44 to 134 μM.

10. The pharmaceutical formulation of claim 1, further comprising an intraocular irrigation carrier into which the formulation is injected, wherein after injection the phenylephrine is present at a concentration of from 240 to 720 μM and the ketorolac is present at a concentration of from 10 to 270 μM.

11. The pharmaceutical formulation of claim 1, wherein the phenylephrine and ketorolac are included at a molar ratio of from 1:1 to 13:1 phenylephrine to ketorolac.

12. The pharmaceutical formulation of claim 1, wherein the phenylephrine and ketorolac are included at a molar ratio of from 3:1 to 10:1 phenylephrine to ketorolac.

13. A sterile liquid pharmaceutical dosage form for injection, comprising phenylephrine, ketorolac, a buffer system and an aqueous carrier packaged in a single-use container for injection, wherein the dosage form is preservative-free and antioxidant-free.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A sterile liquid pharmaceutical formulation comprising phenylephrine, ketorolac and a buffer system in an aqueous carrier, wherein the formulation is preservative-free and antioxidant-free and is stable for at least six months when stored at a temperature of from 5+/-3°C to 25+/-2°C.

2. The pharmaceutical formulation of claim 1, wherein the buffer system is selected from a sodium phosphate buffer system and a sodium citrate buffer system.

3. The pharmaceutical formulation of claim 2, wherein the buffer system comprises a sodium citrate buffer system.

4. The pharmaceutical formulation of claim 3, wherein the buffer system comprises an about 20 mM sodium citrate buffer system.

5. The pharmaceutical formulation of claim 1, wherein the pharmaceutical formulation has a pH of from 5.8 to 6.8.

6. The pharmaceutical formulation of claim 4, wherein the pharmaceutical formulation has a pH of from 5.8 to 6.8.

7. The pharmaceutical formulation of claim 1, wherein formulation is stable for a period of at least 24 months when stored at a temperature of from 5+/-3°C to 25+/-2°C.

8. The pharmaceutical formulation of claim 1, wherein the formulation is contained within a single-use container.

9. The pharmaceutical formulation of claim 1, wherein the formulation comprises from 46 to 76 mM phenylephrine and from 8.5 to 14 mM ketorolac.

10. The pharmaceutical formulation of claim 9, wherein the formulation comprises about 60.75 mM phenylephrine and about 11.25 mM ketorolac.

11. The pharmaceutical formulation of claim 1, further comprising an intraocular irrigation carrier into which the formulation is injected, wherein after injection the phenylephrine is present at a concentration of from 30 to 720 μM and the ketorolac is present at a concentration of from 44 to 134 μM.

12. The pharmaceutical formulation of claim 1, further comprising an intraocular irrigation carrier into which the formulation is injected, wherein after injection the phenylephrine is present at a concentration of from 240 to 720 μM and the ketorolac is present at a concentration of from 10 to 270 μM.

13. The pharmaceutical formulation of claim 1, wherein the phenylephrine and ketorolac are included at a molar ratio of from 1:1 to 13:1 phenylephrine to ketorolac.

14. The pharmaceutical formulation of claim 1, wherein the phenylephrine and ketorolac are included at a molar ratio of from 3:1 to 10:1 phenylephrine to ketorolac.

15. A sterile liquid pharmaceutical formulation consisting essentially of phenylephrine, ketorolac and a buffer system in an aqueous carrier, wherein the formulation is stable for at least six months when stored at a temperature of from 5+/-3°C to 25+/-2°C.

16. The pharmaceutical formulation of claim 15, wherein the buffer system comprises a sodium citrate buffer system.

17. The pharmaceutical formulation of claim 15, wherein the pharmaceutical formulation has a pH of from 5.8 to 6.8.

18. The pharmaceutical formulation of claim 15, wherein formulation is stable for a period of at least 24 months when stored at a temperature of from 5+/-3°C to 25+2°C.

19. The pharmaceutical formulation of claim 15, wherein the formulation is contained within a single-use container.

20. The pharmaceutical formulation of claim 15, wherein the formulation comprises about 60.75 mM phenylephrine and about 11.25 mM ketorolac.

21. The pharmaceutical formulation of claim 15, further comprising an irrigation carrier into which the formulation is injected, wherein after injection the phenylephrine is present at a concentration of from 240 to 720 μM and the ketorolac is present at a concentration of from 10 to 270 μM.

22. The pharmaceutical formulation of claim 15, wherein the phenylephrine and ketorolac are included at a molar ratio of from 3:1 to 10:1 phenylephrine to ketorolac.

23. A sterile liquid pharmaceutical dosage form for injection, comprising phenylephrine, ketorolac, a buffer system and an aqueous carrier packaged in a single-use container for injection.

24. The dosage form of claim 23, wherein the container is selected from a vial closed with a closure through which an injection can be drawn and a pre-filled syringe.

25. A sterile liquid pharmaceutical formulation comprising phenylephrine, ketorolac, a buffer system and an intraocular irrigation carrier, wherein the phenylephrine is included at a concentration of from 30 to 720 μM and the ketorolac is included at a concentration of from 10 to 270 μM.

26. The pharmaceutical formulation of claim 25, wherein the phenylephrine is included at a concentration of from 90 to 720 μM and the ketorolac is included at a concentration of from 44 to 134 μM.

27. The pharmaceutical formulation of claim 25, wherein the formulation is preservative-free and antioxidant-free.