Claims

1. A preservative removing device comprising a porous hydrophilic polymeric matrix,

wherein the porous hydrophilic polymeric matrix comprises a hydraulic permeability greater than 0.01 Da, greater than 25% of a comonomer which increases the hydrophilicity of the porous hydrophilic polymeric matrix, and fits an outlet of a container for a solution, emulsion, or suspension,

wherein the solution, emulsion, or suspension is configured to flow through the porous hydrophilic polymeric matrix, and

wherein the porous hydrophilic polymeric matrix is configured to remove at least 50% of a preservative and retain at least 50% of a hydrophobic ophthalmic agent within the solution, emulsion or suspension.

2. The preservative removing device according to claim 1, wherein the porous hydrophilic polymeric matrix has a partition coefficient for the preservative from the solution, emulsion, or suspension of at least 100.

3. The preservative removing device according to claim 1, wherein the porous hydrophilic polymeric matrix comprises particles.

4. The preservative removing device according to claim 1, wherein the porous hydrophilic polymeric matrix is preloaded with the preservative at 1 to 90% of saturation of the preservative in the porous hydrophilic polymeric matrix.

5. The preservative removing device according to claim 1, wherein the porous hydrophilic polymeric matrix comprises poly hydroxyl ethyl methacrylate (pHEMA), poly hydroxyl ethyl methacrylate-co-methacrylic acid, or a combination thereof.

6. The preservative removing device according to claim 1, wherein the porous hydrophilic polymeric matrix has interconnected pores, wherein the pores have an average radius of 1 to 60 μm.

7. The preservative removing device according to claim 1, wherein the porous hydrophilic polymeric matrix is partitioned as microparticles with cross-sections of 2 to 100 μm.

8. The preservative removing device according to claim 1, wherein the hydraulic permeability is greater than 1 Da.

9. The preservative removing device according to claim 1, wherein the preservative is benzalkonium chloride (BAK).

10. The preservative removing device according to claim 9, wherein the porous hydrophilic polymeric matrix is preloaded with the BAK at a concentration of one to 100 times that of the solution, emulsion, or suspension in the container.

11. The preservative removing device according to claim 4, wherein the porous hydrophilic polymeric matrix is preloaded with a second preservative.

12. The preservative removing device according to claim 1, wherein the porous hydrophilic polymeric matrix includes the hydrophobic ophthalmic agent at a level below saturation.

13. The preservative removing device according to claim 1, wherein the porous hydrophilic polymeric matrix is saturated with the hydrophobic ophthalmic agent.

14. The preservative removing device according to claim 1, wherein the hydrophobic ophthalmic agent comprises dexamethasone, bimatoprost, or latanoprost.

15. The preservative removing device according to claim 5, wherein the porous hydrophilic polymeric matrix comprises poly hydroxyl ethyl methacrylate-co-methacrylic acid and wherein the poly hydroxyl ethyl methacrylate-co-methacrylic acid comprises 60%-75% methacrylic acid and 25%-40% hydroxyl ethyl methacrylate by volume.

16. The preservative removing device according to claim 5, wherein the porous hydrophilic polymeric matrix comprises a cross-linker and wherein the cross-linker comprises ethylene glycol dimethacrylate or SR9035.

17. The preservative removing device according to claim 1, wherein the porous hydrophilic polymeric matrix comprises tert-butyl methacrylate and methacrylic acid in a ratio of 25 to 75 by volume.

18. The preservative removing device according to claim 1, wherein a partition coefficient of the porous hydrophilic polymeric matrix for the hydrophobic ophthalmic agent is within a range from 10 to 50.

19. A method of administering an ophthalmic agent, comprising:

providing a compressible bottle comprising a preservative removing device at the outlet of the compressible bottle, wherein the preservative removing device comprises a porous hydrophilic polymeric matrix comprising greater than 25% of a comonomer which increases the hydrophilicity of the porous hydrophilic polymeric matrix;

providing a solution comprising a hydrophobic ophthalmic agent and a preservative; and

applying pressure to the compressible bottle, wherein the solution is forced through the preservative removing device, wherein at least 50 percent of the preservative is removed

from the solution and wherein at least 50 percent of the hydrophobic ophthalmic agent is retained by the solution.