What is claimed is:

1. A package comprising:

a sterile barrier packaging film;

self-sterilizing components comprising: a plurality of chlorite ions and water, wherein the self-sterilizing components are substantially free of an energy-activated catalyst and of an acid-releasing compound;

a package interior formed by hermetically sealing the sterile barrier packaging film; and

a headspace within the package interior comprising carbon dioxide present in an amount of greater than or equal to 5% by volume of the headspace;

wherein when the package is exposed to ultraviolet (UV) light having a wavelength of 254 nm, reaction of the chlorite ions with the water generates chlorine dioxide (ClO_2), which is released into the headspace.

2. The package of claim 1, wherein in the absence of any UV light, there is not chlorine dioxide (ClO_2) generation.

3. The package of claim 1, wherein the water is proximate to the plurality of chlorite ions.

4. The package of claim 1 having a relative humidity in the package interior in the range of greater than or equal to 20 % to less than or equal to 100 % at 72.5 °F.

5. The package of claim 1, wherein a salt comprising sodium chlorite, potassium chlorite, calcium chlorite, magnesium chlorite, lithium chlorite, ammonium chlorite, or mixtures thereof supplies the plurality of chlorite ions.

6. The package of claim 1, wherein the sterile barrier packaging film is substantially ultraviolet (UV)-light transparent.

7. The package of claim 1, wherein the sterile barrier packaging film comprises a primary layer and a patch affixed to the primary layer, wherein the patch supplies the plurality of chlorite ions.

8. The package of claim 7, wherein the patch comprises:

a patch support that is permeable to chlorine dioxide and that defines a first major surface of the patch; and

a patch sealing layer comprising the plurality of chlorite ions dispersed in a polymer composition, wherein the patch sealing layer is in contact with the patch support and defines a second major surface of the patch, and wherein the patch sealing layer is affixed to the primary layer.

9. The package of claim 8, wherein the polymer composition comprises at least one of: a polyethylene, a polypropylene, a polyacrylate, or a copolymer of any of these.

10. The package of claim 1, wherein the plurality of chlorite ions is present in a coating on of the self-sterilizing packaging film, and the coating comprises a chlorite salt in combination with a polymer composition.

11. The package of claim 10, wherein the polymer composition comprises at least one of: a polyethylene, a polypropylene, a polyacrylate, or a copolymer of any of these.

12. A packaged product comprising:

a packaging film;

a plurality of chlorite ions;

water;

a package interior formed by hermetically sealing the packaging film;

a product within the package interior; and

a headspace within the package interior comprising carbon dioxide present in an amount of greater than or equal to 5% by volume of the headspace;

wherein self-sterilizing components comprise: the water and the plurality of chlorite ions, and are substantially free of energy-activated catalyst and are substantially free of an acid releasing compound; and

wherein when the packaging film is exposed to ultraviolet (UV) light having a wavelength of 254 nm, reaction of the chlorite ions with the water generates chlorine dioxide (ClO_2), which is released into the headspace and is effective to sterilize the product within the package interior.

13. The packaged product of claim 12, wherein the packaging film comprises a primary layer and a patch affixed to the primary layer, wherein the patch supplies the plurality of chlorite ions.

14. The packaged product of claim 13, wherein the patch comprises:

a patch support that is permeable to chlorine dioxide; and

a patch sealing layer comprising the plurality of chlorite ions dispersed in a polymer composition, wherein the patch sealing layer is in contact with the patch support, and wherein the patch sealing layer is affixed to the primary layer.

15. The packaged product of claim 14, wherein the polymer composition comprises at least one of: a polyethylene, a polypropylene, a polyacrylate, or a copolymer of any of these.

16. The packaged product of claim 12, wherein the product within the package interior is a medical device or a medical supply.

17. The packaged product of claim 12, wherein the product within the package interior is a food.

18. A method of sterilizing a packaged product comprising:

providing an unsealed package comprising:

a sterile barrier packaging film comprising a primary layer and a plurality of chlorite ions; and

a package interior; and

introducing water to the package interior;

introducing a product to be sterilized to the package interior,

introducing a gas comprising carbon dioxide to the package interior of the package;

hermetically sealing an open end of the unsealed package after introducing the gas comprising carbon dioxide to form a self-sterilizing package containing a packaged product and a headspace, wherein the headspace comprises the carbon dioxide in an amount of greater than or equal to 5% by volume of the headspace; and

exposing the self-sterilizing package to UV radiation;

wherein self-sterilizing components comprise: the water and the plurality of chlorite ions, and are substantially free of an energy-activated catalyst and of an acid-releasing compound.