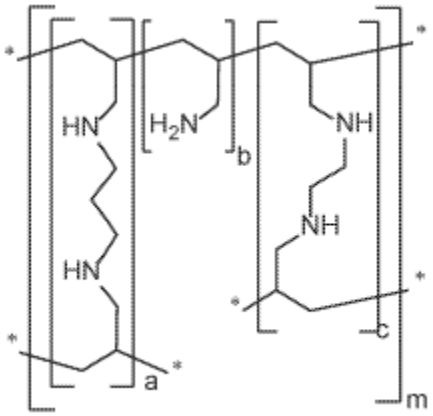
What is claimed is:

1. A packaged pharmaceutical product comprising a crosslinked poly(allylamine) polymer, wherein the crosslinked poly(allylamine) polymer is of formula (I):



(I)

wherein:

a is a residue of N, N'-diallyl-1,3-diaminopropane or a salt thereof;

b is a residue of allylamine;

c is a residue of 1,2 dichloroethane; and

m represents a repeating unit of the crosslinked poly(allylamine) polymer, and less than 1.0% of the total number of carbon atoms present in the crosslinked poly(allylamine) polymer are sp2 allyl carbons, wherein the packaged pharmaceutical product comprises one or more of a laminate film with an oxygen transfer rate of 0.05 CC/m^2/day or less, an oxygen scavenger, or an inert environment within the packaged pharmaceutical product.

2. The packaged pharmaceutical product of claim 1, wherein the packaged pharmaceutical product comprises an oxygen scavenger.

3. The packaged pharmaceutical product of claim 2, wherein the oxygen scavenger is selected from iron, ferrous oxide, iron oxide powder, a ferrous salt, a sulfite, a bisulfite, a reducing sulfur compound, ascorbic acid, Pd, Cu, ZN, Mg, Mn, Co(II), Zn, ascorbic acid, an

ascorbic acid salt, isoascorbic acid, tocopherol, hydroquinone, catechol, rongalit, sorbose, lignin, gallic acid, gallic acid, potassium carbonate, erythorbic acid, a quinone, catechol, butylated hydroxytoluene (BHT), butylated hydroxyanisole (BHA), a polyunsaturated fatty acid, glucose oxidase, laccase, or ethanol oxidase.

4. The packaged pharmaceutical product of claim 1, wherein the packaged pharmaceutical product comprises an inert environment within the packaged pharmaceutical product.

5. The packaged pharmaceutical product of claim 4, wherein the inert environment is 99+ % nitrogen.

6. The packaged pharmaceutical product of claim 1, wherein the packaged pharmaceutical product further comprises an oxygen scavenger and/or an inert environment within the packaged pharmaceutical product.

7. The packaged pharmaceutical product of claim 1 wherein less than 0.9% of the total number of carbon atoms present in the crosslinked poly(allylamine) polymer are sp2 allyl carbons.

8. The packaged pharmaceutical product of any preceding claim wherein less than 0.8% of the total number of carbon atoms present in the crosslinked poly(allylamine) polymer are sp2 allyl carbons.

9. The packaged pharmaceutical product of any preceding claim wherein more than 0.3% of the total number of carbon atoms present in the crosslinked poly(allylamine) polymer are sp2 allyl carbons.

10. The packaged pharmaceutical product of claim 1 wherein the ratio of the carbon to nitrogen weight ratio of the poly(allylamine) polymer to the carbon to nitrogen weight ratio of the crosslinked poly(allylamine) polymer is about 0.9.

11. The packaged pharmaceutical product of claim 1 wherein the integration of the sp2 allyl carbon peaks between 110 - 150 ppm and alkyl carbon peaks between 0 - 80 ppm is used to quantitate the percentage of sp2 allyl carbons using the formula

$$\%\ sp2\ allyl\ carbons = \frac{peak\ integration\ (110-150\ ppm)}{peak\ integration\ (0-80\ ppm)+peak\ integration(110-150\ ppm)} \text{X100.}$$

12. The packaged pharmaceutical product of claim 11 wherein the percentage sp2 allyl carbons in the poly(allylamine)polymer is determined by ^{13}C NMR and the ^{13}C NMR is quantitative ^{13}C solid state magic angle spinning (MAS) NMR.

13. The packaged pharmaceutical product of any preceding claim wherein the crosslinked poly(allylamine) polymer contains less than 20 ppm allylamine (H2C=CHCH2NH2) as an impurity.

14. The packaged pharmaceutical product of any preceding claim wherein when tested with the Heated Stability Assay (Stability Assay 2) the allylamine content of the crosslinked poly(allylamine) polymer increases by less than 1.5 ppm/day allylamine.

15. The packaged pharmaceutical product of any preceding claim for use in a method of treating metabolic acidosis.