

Patent claims

1. A multilayer packaging film comprising at least three different types of layers (A), (B), and (C):
 - (A) is at least one outer layer,
 - (B) is at least one passive oxygen barrier layer,
 - (C) is at least one active oxygen scavenging layer,characterized in that
 - the at least one outer layer (A) is a thermoplastic polymer;
 - the at least one passive oxygen barrier layer (B) is selected from the group consisting of ethylene vinyl alcohol copolymers, polyvinylchloride, copolymers of polyvinyl chloride, polyvinyl alcohol, polyvinylidene dichloride, copolymers of polyvinylidene dichloride, polyacrylonitrils, copolymers of polyacrylonitrils, polyethylene terephthalate, polyethylene naphthalate, polyethylenefuranoate, polysiloxanes, and polyamides;
 - the at least one active oxygen scavenging layer (C) comprises
 - a) a plastic material which is a polyolefin, a polyolefin copolymer or a polystyrene, and additives (b) and (c), wherein
 - b) is a polyterpenic resin; and
 - c) is a transition metal catalyst.
2. The multilayer packaging film as claimed in claim 1 wherein the additives b) and c) are combined in the same oxygen scavenging layer.
3. The multilayer packaging film as claimed in claim 1 or 2 further comprising at least one inner layer (D) which is a thermoplastic polymer.
4. The multilayer packaging film as claimed in any of the preceding claims, wherein at least one of the active oxygen scavenging layers (C) is sandwiched between a passive oxygen barrier layer (B) and an inner layer (D) or, when this is lacking, the inside of the packaging itself.

5. The multilayer packaging film as claimed in any of the preceding claims wherein one or more further layers selected from the group consisting of moisture barrier layers, strengthening layers and adhesive layers are positioned between at least two of the layers (A), (B), (C), and (D).
6. The multilayer packaging film as claimed in any of the preceding claims wherein the polyterpenic resin (b) contains monomers selected from alpha-pinene, beta-pinene, gamma-ter-pinene, limonene, norbornene, myrcene, phellandrene, carvone, camphene, 2-carene, 3-carene, perillyl alcohol, perillyl aldehyde, perillyl acid, alkyl esters of perillyl alcohol, aryl esters of perillyl alcohol, arylalkyl esters of perillyl alcohol, alkylaryl esters of perillyl alcohol, alpha-ionone, beta-ionone, beta-citronellol, beta-citronellene, citronellal, citronellic acid, alkyl esters of beta-citronellol, aryl esters of beta-citronellol, arylalkyl esters of beta-citronellol, alkylaryl esters of beta-citronellol, geraniol, geranial, alkyl esters of geraniol, aryl esters of geraniol, arylalkyl esters of geraniol, alkylaryl esters of geraniol, linalool, alkyl esters of linalool, aryl esters of linalool, arylalkyl esters of linalool, alkylaryl esters of linalool, nerolidol, alkyl esters of nerolidol, aryl esters of nerolidol, arylalkyl esters of nerolidol, alkylaryl esters of nerolidol, verbenol, verbenone, alkyl esters of verbenol, aryl ester verbenol, arylalkyl esters of verbenol, alkylaryl esters of verbenol and mixtures thereof.
7. The multilayer packaging film as claimed in any of the preceding claims wherein the polyterpenic resin (b) is a homopolymer or copolymer of alpha-pinene, beta-pinene or mixtures of alpha/beta pinene.
8. The multilayer packaging film as claimed in any of the preceding claims wherein the transition metal catalyst (c) contains iron, nickel, manganese, cobalt or copper.
9. The multilayer packaging film as claimed in any of the preceding claims wherein, the additive (b) is used in an amount of from 0.05 to 10 % by weight, based on the total weight of the respective active oxygen scavenging layer (C).

10. The multilayer packaging film as claimed in any of the preceding claims wherein the transition metal catalyst (c) is used in an amount of from 0.001 to 1 % by weight, based on the total weight of the respective active oxygen scavenging layer (C).
11. The multilayer packaging film as claimed in any of the preceding claims wherein the thickness of the passive oxygen barrier layers in comparison to the total thickness of the multilayer film ranges between 3 to 30%.
12. The multilayer packaging film as claimed in any of the preceding claims wherein the thickness of the active oxygen scavenging layers in comparison to the total thickness of the multilayer film ranges from 9 to 43%.
13. The multilayer packaging film as claimed in any of the preceding claims, which is in the form of a container.
14. A method for the manufacture of a multilayer packaging film as claimed in any of the preceding claims comprising the step of providing the polymers according to the layers (A), (B) and (C) and optionally (D), providing the additives (b) and (c) and comprising a mixing step and a shape forming process.
15. The method as claimed in claim 14 wherein the additives (b) and (c) are provided in the form of a masterbatch.