

Temperature sensitive material



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Invention



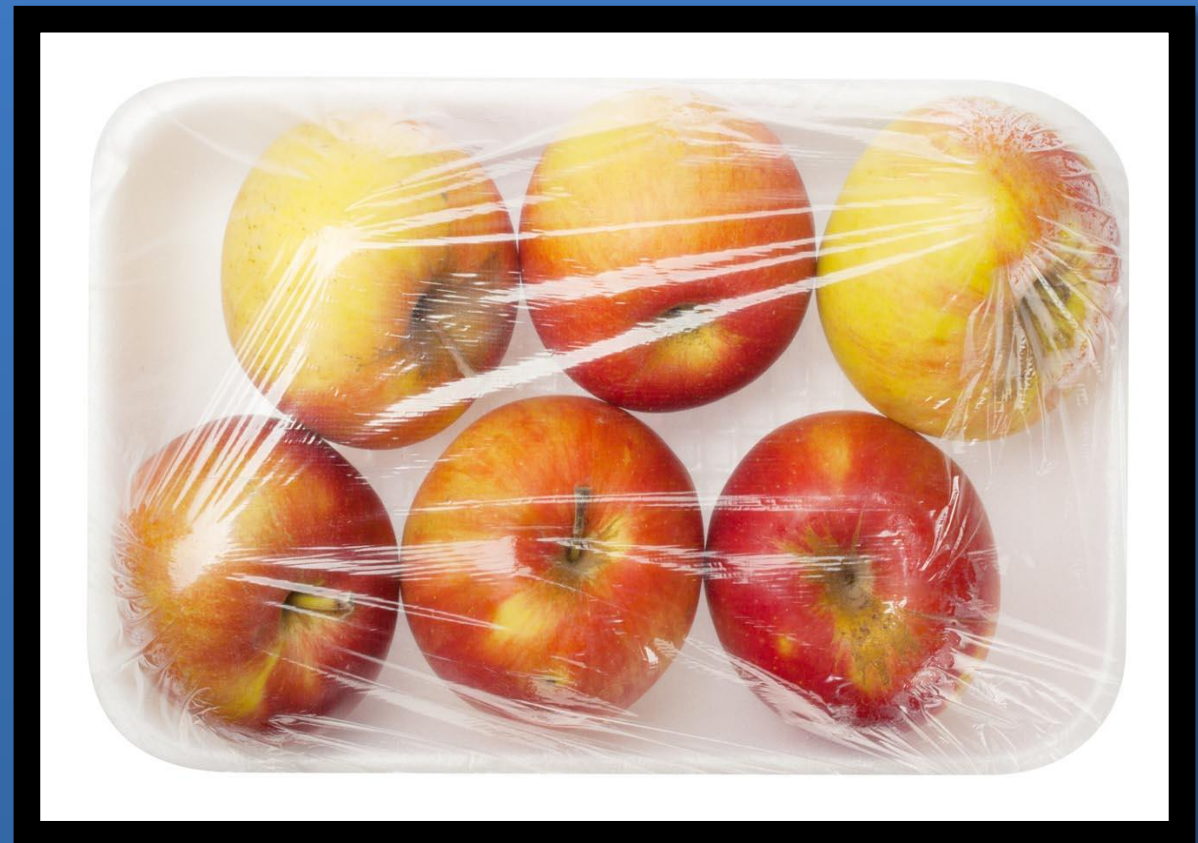
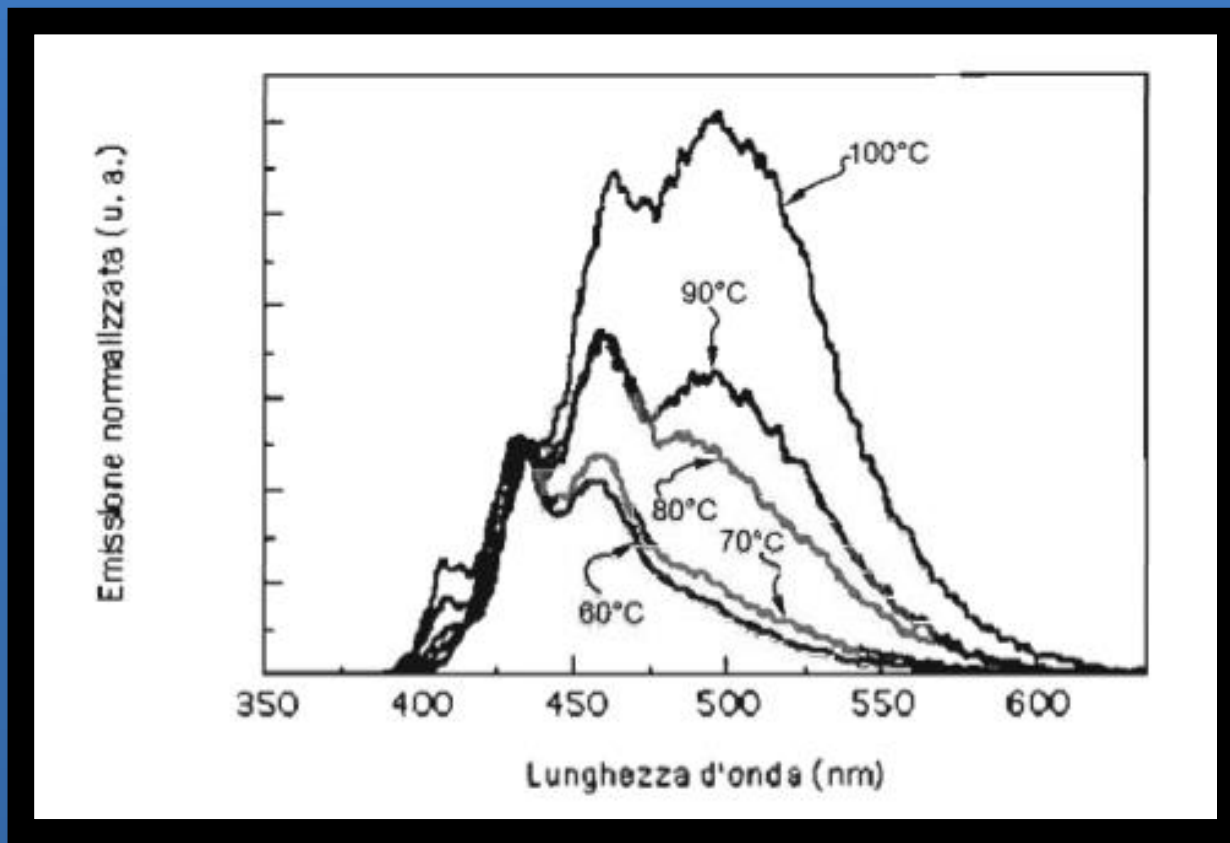
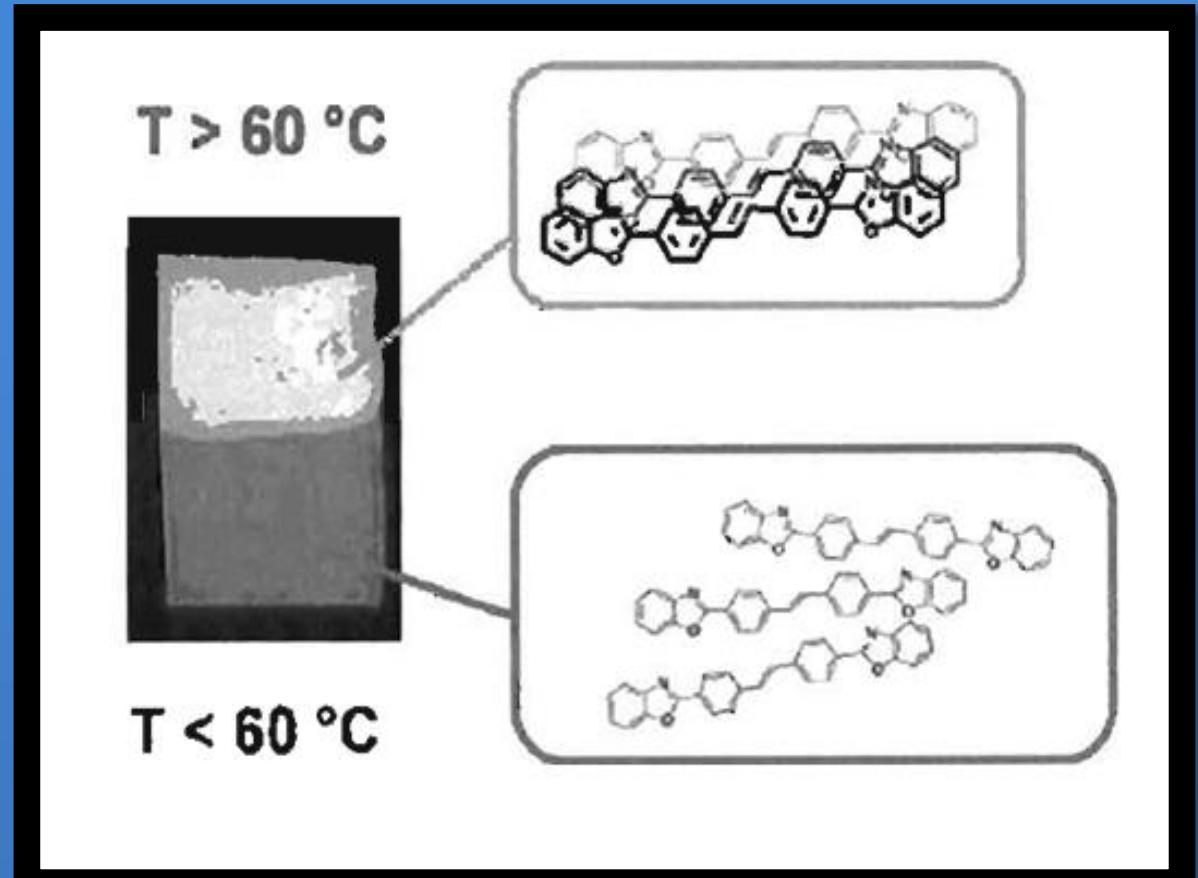
The invention relates to a novel **thermally sensitive material and articles** such as labels, packaging, paints, inks or fibers comprising the material of the invention. More particularly, the material of the invention is a material comprising a **polymer matrix** in which is dispersed a luminescent dye that, upon thermal stress, can change **its luminescence profile**.

At the state of the art, thermoplastic polymer-based objects containing thermochromic inks or polymers are known to change colour and chromatic intensity when the object is exposed above a certain temperature threshold or brought into contact with a high-temperature body.

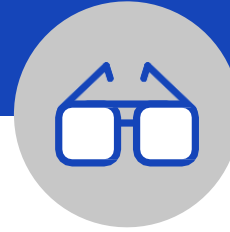
In general, both the **temperature-sensitive materials described in the literature** and those used for the realization of intelligent packaging provide an optical response exclusively in absorption following a thermal stress and are **therefore partially or totally coloured**.

Thus, the purpose of the present invention is to provide a thermally sensitive and responsive material (i.e., capable of detecting thermal stress by responding with a detectable signal) that is suitable for use in the **manufacture of a wide range of products such as labels and rigid or flexible packaging for food packaging, paints, inks, and others**.

Drawings
& pictures



Industrial applications



The polymer blends used to make the material of the invention were formulated using conventional industrial preparation, blending and processing procedures.

The realization of materials that are already responsive to temperatures slightly above ambient is of vital importance in applications such as **food packaging**, where thermal stresses can be critical to the stability of the package contents.

The material according to the invention is preferably used in the form of a thin **film or foil**, having a thickness generally less or equal to 100um, or for making devices suitable for detecting thermal stresses, **such as labels for application to rigid or flexible packaging**.

However, the material can be used in any way and in any physical form: for example, it can be used in **liquid or fluid compositions such as paints or inks for printing**, it can be **dispersed between the fibers of a fabric to make textiles responsive to thermal stresses**, it can be **incorporated directly into a basic structural material**, such as a plastic, rubber, fiber or composite material, to make products or articles capable of detecting and signalling any thermal stresses to which they are subjected. In such base materials, the polymer mixture is added in an amount of less than 10% by weight. The material of the invention may be dispersed in the base material, or a macroscopic combination between the base material and the material of the invention may be employed, for example by embedding, lamination, painting, printing or others.

Possible developments



The invention presents a **thermally sensitive material** with innumerable potential applications.

Detecting the exposure of an object above a certain temperature threshold is critical in many industries, **such as food, pharmaceutical, medical.**

The invention can be applied to rigid or flexible packaging labels, used in inks, paints, fibers or fabrics.

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