Shaped Artificial Polymer Articles

The present invention relates to the use of specific porous metal oxide spheres (e.g., microspheres) as light stabilizers for a shaped artificial polymer article, and corresponding shaped artificial polymer articles and corresponding extruded, casted, spun, molded or calendered polymer compositions.

Certain porous metal oxide spheres have now been found to be especially efficacious towards stabilizing polymers against degradation, especially degradation induced by UV light. In addition, it has been found that these show a synergistic effect with respect to such stabilization in combination with other UV absorbers.

In an aspect, the present disclosure relates in particular to the use of porous metal oxide spheres as light stabilizers for a shaped artificial polymer article, wherein
the polymer is a synthetic polymer and/or a natural or synthetic elastomer and
the porous metal oxide spheres comprise a metal oxide and are prepared, e.g., by a method comprising
forming a liquid dispersion of polymer particles (e.g., nanoparticles) and a metal oxide;
forming liquid droplets of the dispersion;
drying the liquid droplets to provide polymer templatespheres (e.g., microspheres) comprising polymer spheres (e.g., nanospheres) and metal oxide; and
removing the polymer spheres from the template microspheres to provide the porous metal oxide spheres, and
wherein the spheres have, e.g.,
an average diameter of from 0.5 µm to 100 µm,
an average porosity of from 0.10 to 0.80 and
an average pore diameter of from 50 nm to 999 nm.

In another aspect, there is provided a shaped artificial polymer article wherein the polymer is a synthetic polymer and/or a natural or synthetic elastomer and wherein the polymer contains porous metal oxide microspheres as defined above.

In another aspect, there is provided an extruded, casted, spun, molded or calendered polymer composition wherein the polymer is a synthetic polymer and/or a natural or synthetic elastomer and wherein the polymer contains porous metal oxide microspheres as defined above.

Brief Description of the Drawings

The disclosure described herein is illustrated by way of example and not by way of limitation in the accompanying figures. For simplicity and clarity of illustration, features illustrated in the figures are not necessarily drawn to scale. For example, the dimensions of some features may be exaggerated relative to other features for clarity. Further, where considered appropriate, reference labels have been repeated among the figures to indicate corresponding or analogous elements.

Fig. 1 shows a general outline for the preparation of porous microspheres according to an embodiment of the invention.

Fig. 2 is a scanning electron microscope (SEM) image of a polymer template microsphere, according to an embodiment of the invention.

Fig. 3 is a SEM image of a porous silica microsphere, according to an embodiment of the invention.