However, it was found that it was not possible to further increase the concentration in dialkyl peroxide in a composition comprising isododecane, i.e. beyond 70% by weight, without risking a downgrade of the type F classification established in accordance with the UN regulations. Indeed, the reaction to heating under confinement of such a composition in accordance with the UN tests is not "low" or "null" but "moderate" and can thus entail a risk of explosion. In other words, at a dialkyl peroxide content of more than 70% by weight, it is not possible to package the same quantity of composition under the same conditions (the packaging dimensions must therefore be reduced).

Moreover, in some applications, the presence of a large amount of solvent, in particular isododecane, can have, when using an organic peroxide based composition a certain number of drawbacks, such as solvent exudation, particularly when the organic peroxide is used in high-temperature extrusion processes, or potential exudation ("fogging") when using the polyproylene in which the organic peroxide is added.

Another drawback of this type of composition also arises from the possible presence of trace solvents in the polypropylenes eventually obtained by visbreaking. This leads to additional logistics and expenses in terms of implementation in order to separate the polypropylenes from the trace solvents.

Therefore, one of the purposes of the present disclosure is notably to propose dialkyl peroxide compositions with a content greater than 70% by weight whilst conforming to the type F classification in accordance with the UN regulations.

In other words, there is a genuine need to propose compositions with higher dialkyl peroxide concentration, without downgrading their type F classification in accordance with the UN regulations, so that these compositions can be transported and stored at least in the same safety conditions as conventional compositions comprising 70% by weight in dialkyl peroxide in isododecane.

In view of the foregoing, the purpose of the disclosure is notably to propose liquid dialkyl peroxide compositions that do not have the aforementioned drawbacks.

The present disclosure thus relates to, in an aspect, a liquid composition comprising at least one dialkyl peroxide, in liquid form at ambient temperature, with a content greater than 72% by weight and strictly less than 80% by weight relative to the total weight of the composition, and at least one mineral oil with a viscosity greater than 15 mPa.s, measured at a temperature of 10°C and a shear rate of 1000 s^{-1}.

The composition according to the disclosure shows low or no effect to heating under confinement.

In another aspect, there is provided the use of the composition as defined above, to modify the melt rheology of the polypropylene.

In another aspect, there is provided a method for modifying the melt rheology of the polypropylene comprising a step in which the polypropylene is extruded at a temperature of between 140 and 300°C and more particularly between 170°C and 250°C, for a few seconds to a maximum of a few minutes in the presence of a composition as defined above.

In another aspect, there is provided the use of at least one mineral oil with viscosity greater than 15 mPa.s, measured at a temperature of 10°C and at a shear rate of 1000 s-1, to decrease the explosion intensity of a composition comprising at least one dialkyl peroxide in a content greater than 72% by weight and strictly less than 80% by weight, relative to the total weight of the composition.

In another aspect, there is provided a composition as defined above, packaged in a container having a volume of at least 450 litres.

The terms "low" effect and "no" effect correspond to a result that is likely to be obtained in the tests of heating under confinement, as defined in section 25 of the Manual of Tests and Criteria of the UN Recommendations on the Transport of Dangerous Goods, revised edition of 2015.

Preferably, the composition according to the present invention does not detonate in a cavitated state, does not deflagrate, shows low or no effect when heated under confinement, and has low or no explosive power.

CLAIMS

1. A liquid composition comprising at least one dialkyl peroxide, in liquid form at ambient temperature, with a content greater than 72% by weight and strictly less than 80% by weight relative to the total weight of the composition, and at least one mineral oil with viscosity greater than 15 mPa.s, measured at a temperature of 10°C and a shear rate of 1000 s^{-1}.

2. The composition according to claim 1, characterised in that the dialkyl peroxide is chosen among 2,5-dimethyl-2,5-di(tert-butylperoxy)-hexyne-3, ditert-butylperoxyde, ditert-amyl peroxyde, 2,5-dimethyl-2,5(di(tert-butylperoxy)hexane, and mixtures thereof.

3. The composition according to claim 1 or 2, characterised in that the dialkyl peroxide is 2,5-dimethyl-2,5(di(tert-butylperoxy)hexane.

4. The composition according to any of the preceding claims, characterised in that the content of the dialkyl peroxide is comprised within a range of from 73 to 79% by weight, preferably from 74 to 78% by weight, and yet more preferentially from 75 to 77% by weight, relative to the total weight of the composition.

5. The composition according to any of the preceding claims, characterised in that the mineral oil has a viscosity of from 15 to 1000 mPa.s, preferably from 100 to 1000 mPa.s, preferably from 100 to 500

mPa.s, and yet more preferentially from 250 to 400 mPa.s, measured at a temperature of 10°C and at a shear rate of 1000 s^{-1}.

6. The composition as claimed in any one of the preceding claims, characterized in that the mineral oil is chosen among the paraffin oils.

7. Use of the composition according to any one of the preceding claims, to modify the melt rheology of the polypropylene.

8. Use of the composition according to claim 7, to modify the melt viscosity of the polypropylene.

9. Use according to claim 7, to increase the melt flow index of the polypropylene.

10. Method for modifying the melt rheology of the polypropylene comprising a step in which the polypropylene is extruded at a temperature of between 140 and 300°C and more particularly between 170°C and 250°C, for a few seconds to a maximum of a few minutes in the presence of a composition as defined according to any one of claims 1 to 6.

11. Method according to claim 10 of visbreaking the polypropylene.

12. Method according to claim 10 or 11 in which the polypropylene is a propylene homopolymer or propylene copolymer comprising at least one comonomer chosen among ethylene, 1-butene, 1-hexene and 1-octene.

13. Use of at least one mineral oil with viscosity greater than 15 mPa.s, measured at a temperature of 10°C and at a shear rate of 1000 s-1, to decrease the explosion intensity of a composition comprising at least one dialkyl peroxide in a content greater than 72% by weight and strictly less than 80% by weight, relative to the total weight of the composition.

14. Composition according to any one of claims 1 to 6, packaged in a container having a volume of at least 450 litres.