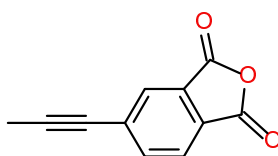


Neximid[®] 500 (MEPA)



2011-04-13

NEXAM is proud to present its latest development in crosslinking chemicals for the polymer industry, a novel crosslinking chemical activated at around 300°C, which is a very attractive temperature especially for the thermoplastics market but also for the sub-super high temperature thermoset market.



NEXIMID[®] 500 (MEPA) (CAS 1240685-26-0)

The unique feature of NEXIMID[®] 500 (MEPA), 5-prop-1-ynylisobenzofuran-1,3-dione, is that it has a more controlled cure, than for example NEXIMID[®] 200 (EPA)¹ which has an extremely fast curing. The cure temperature of NEXIMID[®] 500 is strongly dependant on the system into which it is introduced but in principal the cure on-set is 280-330°C. If incorporated into a material with a glass temperature (T_g) or at melting point above on-set temperature, the typical behavior is that the on-set temperature moves and ends up very closely to the melting temperature or T_g.

When manufacturing and curing thick parts or films where the heat generated during cure needs time to dissipate, NEXIMID[®] 500 offers a very good alternative to NEXIMID[®] 200 which cures at a similar temperature range but is much faster.

The skilled user can easily add NEXIMID[®] 500 to a regular polyimide recipe and end up with a good starting formulation for a crosslinkable polyimide¹. The degree of addition is typically 1-20% of the resin/varnish weight². The system can be further improved and controlled by the addition of crosslinkers within the polymer chain by using e.g. NEXIMID[®] 400 (EBPA).

Most thermoplastics are processed above 250°C but below 300°C, making NEXIMID[®] 500 a very interesting crosslinker candidate for these materials as they can be processed using conventional equipment and then heat activated and crosslinked at a later stage such as at the end of the process, in the tool or at a different location.

Neximid[®] 500 (MEPA)



NEXIMID[®] 500 is completely novel product which is offered only by NEXAM and its distributors. Nexam have pending patent applications on the product.

Footnotes:

¹ WO2011004573 (A1); EP1148078B1; JP58222111A.

² *Example of Polyimide Oligomer Synthesis* – The classic two-step route of polyimide synthesis involves the preparation of a poly(amic acid) in the initial step, followed by cyclo-dehydration of the polymer in the second step. The latter step can be performed either by thermal, chemical or solution methods. The following is a general example of the classic two-step method can be used.

To a reactor equipped with a mechanical stirrer and nitrogen inlet is added dry solvent (typically NMP or Cresol) and diamine e.g. ODA (1.053 molar equivalents). The mixture is stirred under nitrogen flow to completely dissolution of the diamine. Then a dianhydride e.g. NEXIMID[®] 400 (1.000 molar equivalents) and NEXIMID[®] 500 end-capper (0.1089 molar equivalents) are gradually added to the diamine solution. The mixture is stirred under steady nitrogen flow while the anhydrides gradually dissolved (which usually is complete within a few hours). Once the reaction solution is homogeneous, stirring is continued under the same conditions (ambient temperature, nitrogen purge) for 20 hours. This results in a clear, yellow to dark brown poly(amic acid) solution exhibiting somewhat higher viscosity than the initial monomer solution.

This solution can then be further heat treated in solution to result in a fully imidized polyimide or use as it is to make film, prepreg, etc.