NEW SENSITIZERS FOR ACYLPHOSPHINE OXIDES

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The use of long wave sensitizers to activate photoinitiators is well established. For the UV curing industry, this energy transfer effect has already been put to good use, for instance in high speed UV inks. Small additions of isopropylthioxanthone (ITX) to aminoalkylacetophenone photoinitiators such as 2-benzyl-2-(dimethylamino)-4'-morpholino-butyrophenone (Omnirad 369) improve the cure speed by a considerable degree. These systems have been studied in some detail to give a good understanding of the sensitization process[1]. Sensitization of other photoinitiators, such as substituted benzophenones, has also been explored[2]. The currently used mechanism is based on an energy transfer taking place between the triplet states of the sensitizer and the photoinitiator.

For energy transfer to occur only two parameters are critical:

• The triplet energy ET of the sensitizer must be greater than that of the photoinitiator.

• The triplet state of the sensitizer should have a long lifetime (typical of Type II photoinitiators acting as sensitizers).

In this presentation we will describe a new way of sensitizing photoinitiators, focused on acylphosphine oxides.

References

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2. RadTech Europe 2013, W. A. Green.