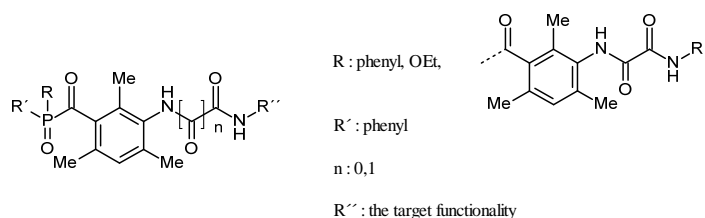


HYDROGEN BOND BALANCED FUNCTIONALIZED ACYL PHOSPHINE OXIDES

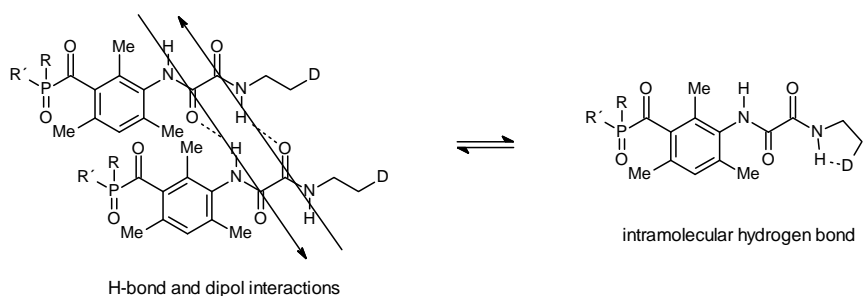
Johan Loccufier

Agfa N.V., Septestraat 27, B-2640 Mortsel, Belgium

The evolution in radiation curing technology towards LED curing in combination with the ever increasing demands in different applications to avoid migration and volatiles, has triggered intensive research towards new photo-initiator designs. Functionalization of acyl phosphine oxides to avoid the formation of mesitaldehyde has been a particularly intensive area of industrial research [1-9]. Recently, functionalization with urea and oxalyl amides has been described by Agfa [10] as a particularly interesting and industrially feasible approach to design functionalized acyl phosphine oxides.



The proposed design allows the introduction of a wide variety of functionalities, allowing to target the photoinitiators at different applications. In order to create sufficient formulation latitude, which is key for broad applicability, the urea and oxalyl amide photoinitiators have to be further functionalized with a well positioned hydrogen bond acceptor to balance inter- and intramolecular interactions, as illustrated below.



[1] EP3378875A1, WO2014051026, EP3511349 (all from Fuji Corporation, Japan)

[2] EP2877500 (Lambson Limited, UK)

[3] WO2019071428 (DIC Corporation, Japan)

[4] JP2012046456 (Kuraray Medical Inc., Japan)

[5] EP1749513 (Ivoclar Vivadent A.G.)

[6] WO2017191043, WO2017211587 (all from Agfa Graphics N.V., Belgium)

[7] WO2019243039 (Agfa N.V., Belgium)