3-KETOQUINOLONES – A NEW CLASS OF PHOTOINITIATOR

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Coumarins, and, in particular, 3-ketocoumarins have long been postulated as useful Norrish Type II photoinitiators [1 - 4] but have not found commercial use until the twin problems of sufficient solubility in 100% solids uv-curing formulations and excellent reactivity at uv-LED wavelengths were overcome [5], [6], [7]. We present a novel and related set of photoinitiators, based on the 3-ketoquinolone ring structure. This class of photoinitators offers the potential advantages over 3-ketocoumarins of simplified structures and visible (blue) light reactivity, along with good solubility and low post-curing migration potential. In this paper, we present synthetic approaches along with characterization and calculations on triplet energies. A patent application has been submitted.

[1] GB 1578662

[2] US 4278751

[3] US 4289844

[4] US 9382433 B2

[5] "Design of New 3-ketocoumarins for UV-LED Curing" by Marika Morone et al., Best Paper Award at RadTech North America, May 2016

[6] "3-Ketocoumarins for LED curing" EP 2909243 B1 and family

[7] "Novel 3-ketocoumarins, a process for their preparation, and their use as photoinitators in photopolymerization reactions" EP 3472410 B1 and family