Curing dynamics and physical property of UV and thermal dual curable clear coats for automotive application

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Clearcoat, a kind of paints coated on outer side of car body, functions to impose clear appearance and protection of inner coats from environmental impact. Clearcoat consists of mainly main resin, cross-linker and other components including solvent and surfactant to improve workability. Physical property of clearcoat is determined by structure of polymer resulted from crosslinking between main resin and cross-linker under specific process condition. In this experiment, UV-thermal dual-curable, hydroxyl- and methacrylate-functionalized urethane oligomer is incorporated as main resin into clearcoat to give ability of dual processes that are UV and thermal curing. As crosslinking initiator, different blocked isocyanates (BI) and same UV initiator are used. This experiment is conducted for characterizing curing dynamics with varying cross-linkers which can be activated by UV and thermal.