

PHOTOCHEMICAL SYNTHESIS OF SPIRO- β -LACTAMS

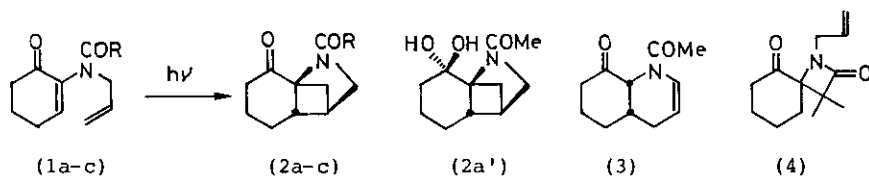
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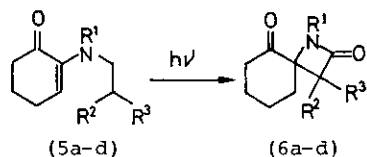
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2-(*N*-Acyl-*N*-alkylamino)cyclohex-2-enones are known to take a variety of reaction courses, depending upon the substituents on the nitrogen atom. In connection with our interest in the intramolecular [2+2] photocycloaddition, we have examined the photochemical behavior of 2-(*N*-acyl-*N*-allylamino)cyclohex-2-enones (**1**). Thus, irradiation of (**1a**) in acetone with a 300W high-pressure mercury lamp in a Pyrex vessel gave two products, (**2a**) (52%) [isolated as its hydrate form (**2a'**)] and (**3**) (2%). Similar irradiation of (**1b**) gave (**2b**) in 61% yield. In contrast, irradiation of (**1c**) gave two products, (**2c**) (26%) and the β -lactam (**4**) (20%). We have then examined the photochemistry of 2-(*N*-acyl-*N*-alkylamino)cyclohex-2-enones (**5**), with the hope that a new synthetic route to the spiro- β -lactams might result. In fact, irradiation of (**5a-d**) in acetone was found to give the corresponding β -lactams (**6a-d**) in moderate yields.



a: R=Me, b: R=Ph, c: R=i-Pr



a, R¹=i-Pr, R²=R³=Me (45%)
 b, R¹=CH₂Ph, R²=SMe, R³=H (57%)
 c, R¹=CH₂Ph, R²=Ph, R³=H (65%)
 d, R¹=CH₂Ph, R²=OMe, R³=H (73%)