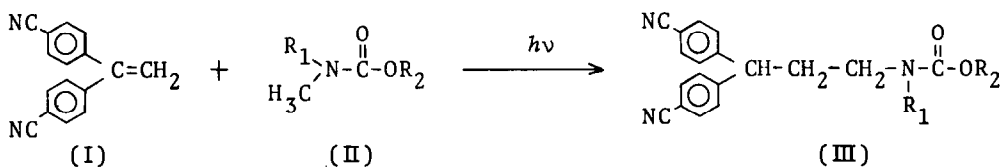


PHOTOCHEMICAL CARBAMOYLATION OF 1,1-BIS(*p*-CYANOPHENYL)ETHYLENE
 WITH SOME CARBAMATES

Yuji Tsujimoto, Yoshiyuki Nishimura, Atsushi Kosaka,
 Harumitsu Kiriya, Takuji Miyamoto, and Yoshinobu Odaira
 Department of Petroleum Chemistry, Faculty of Engineering,
 Osaka University, Suita, Osaka, Japan

As a variety of carbamates have been found to have physiological properties, they have been widely utilized as antileukemic agents, tranquilizers, herbicides etc.¹ Much attention has been paid on the chemical behavior of them, but their photochemical reaction is limited to photo-Fries rearrangement² and oxetan formation with 1,1-diphenylethylene.³ Recently, we have investigated photochemical behavior of *N,N*-dimethylcarbonyl compounds,⁴⁻⁷ and demonstrated in a previous paper⁷ that novel photoureido-methylation takes place very smoothly in the photoreaction of 1,1-bis(*p*-cyano-phenyl)ethylene (I) with tetramethylurea *via* electron transfer from the urea to triplet state of the olefin.

We wish to report in this communication that photoreaction of I with some carbamates affords carbamoylated compounds in high yield, which is contrasted to the results of photoreaction of 1,1-diphenylethylene with ethyl carbamates.³



a: R ₁ =R ₂ =CH ₃	90% ⁸
b: R ₁ =CH ₃ , R ₂ =CH(CH ₃) ₂	84%
c: R ₁ =C ₆ H ₅ , R ₂ =CH ₃	96%
d: R ₁ =H, R ₂ =CH ₃	55%
e: R ₁ = <i>p</i> -CN-C ₆ H ₄ , R ₂ =CH ₃	37%

On irradiation of an acetonitrile solution of I and five molar excess of carbamates (IIa,b) with a 500W high pressure mercury arc for 20-30 hr, carbamoylated products (IIIa,b) were obtained in good yields. Similar

