In: Photophysics and Photochemistry 2000 Conference (Portugal, Oeiras, 19-21 October, 2000).-P45.

MAGNETIC FIELD EFFECT ON THE OUTPUT OF PRODUCTS OF (1-PHENYL-2-BROMETHENYL)PHOSPHINE UV IRRADIATION

Maria N. Bukina[1], Alexander V. Barmasov[1], Vladimir E. Kholmogorov[1], Alexander N. Androsenko[2], Mikhail V. Sendjurev[2]

1) St.Petersburg State University, Institute of Physics, Ulianovskaya ul., 1, St.Petersburg 198904 Russia
2) St.Petersburg State Technological Institute (Technical University), St.Petersburg, Russia

Photochemical transformation of (1-phenyl-2-bromethenyl)phosphine in hexane was studied. We discovered that two products appeared as a result of UV (254 nm) irradiation of specimen. The first product precipitated and it had no luminescence. It was proved by mass-spectrometric and NMR techniques as (1-phenyl-2-bromethenyl)phosphineoxide (I). The second product remained in solution and demonstrated intensive luminescence: the emission spectrum had maximum at 420 nm and excitation spectrum had maximum at 345 nm. The luminescence emission and excitation spectra had similar shapes, that is typical for hard structures with expanded system of π-bonds. Moreover, the luminescence emission (at 420 nm) was quadratic in concentration of species, that is typical for bimolecular reaction. Taking into account the presented spectral data we interpreted the second product as 1,4-bis(diphenylphosphoroyl)-1,4-diphenyl-1,3-butadiene (II).

Besides, it was obtained that studied photoreaction was magnetosensitive. We observed that the luminescence emission intensity in maximum (420 nm) of irradiated in 200 G magnetic field solution exceed on 30% comparing with the luminescence intensity of solution irradiated in absence of external field. If photoreaction was taking place in stronger fields (350-5,000 G) the increase of luminescence intensity was 5%. Since the intensity of luminescence is directly proportional to the concentration of (II), we concluded that the external stationary magnetic fields can influent on the output of photoreaction products.