

PHOTO-DEGRADATION OF DDT IN MICELLAR MEDIUM

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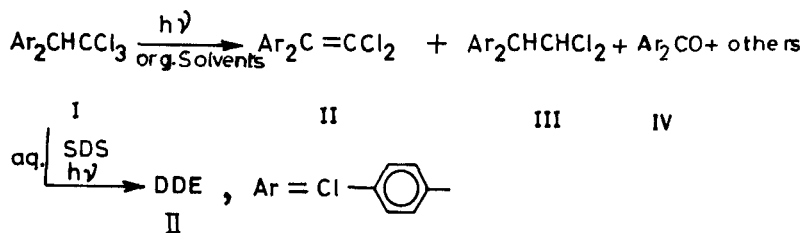
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Direct irradiation of aq. sodium dodecyl sulfate solubilized 1,1,1-trichloro-2,2-bis(p-chlorophenyl)ethane (DDT) leads to 1,1-dichloro-2,2-bis(p-chlorophenyl)ethene (DDE) as the sole photoproduct. DDE does not further degrade in the micellar system.

Photolysis^{1,2} of 1,1,1-trichloro-2,2-bis(p-chlorophenyl)ethane (DDT, I) in a variety of media results in the formation of 1,1-dichloro-2,2-bis(p-chlorophenyl)ethene (DDE, II); 1,1-dichloro-2,2-bis(p-chlorophenyl)ethane (DDD, III) and p,p'-dichlorobenzophenone (DDCO, IV) as the principal photoproducts. Pesticides dispersed in the environment may be solubilized in micellar form, whereby the photoreactivity can be altered. Therefore we have studied the photobehaviour of DDT solubilized in aqueous sodium dodecyl sulfate (SDS).

A degassed solution of SDS-micellized DDT³ (4.3×10^{-5} M DDT in 10^{-2} M aq. SDS) was irradiated at 254 nm in a Rayonet photoreactor. Progress of the photoreaction was monitored by UV spectrophotometry at 233 nm (λ_{\max} of SDS solubilized DDT; $\epsilon = 15,600$) and HPLC (Zorbax Si-60, 10 μ m, 250 x 4.5 mm, petroleum ether, 1 ml/min, 254 nm) which showed the presence of DDT ($R_T = 6.1$ min) and a photoproduct ($R_T = 4.7$ min). The photoproduct was identified as DDE⁴ (II) by co-chromatography.



Irradiation of SDS-solubilised DDT resulted in degradation (70% within 40 min) affording DDE (II). The formation of any other product was not detected, even upon prolonged irradiation (up to 6 h). Thus, DDE (II) seems to resist further degradation under the micellar conditions.

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