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## LETTERS TO THE EDITOR

# Features of Chemical Nuclear Polarization (CNP) in Photolysis of 8-Hydroxy-6-phenyldibenzofurandeuteromethanol System

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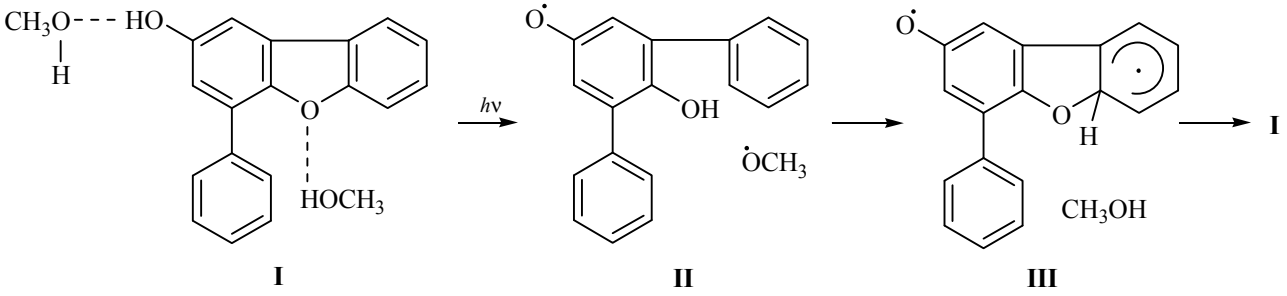
In this work photolysis of 8-hydroxy-6-phenyldibenzofuran (PDF) was carried out in benzene, acetonitrile, and water media directly in the probe of the NMR spectrometer (all of the solvents were deuterated). The $^1$H NMR spectra do not differ virtually from the spectra recorded in the dark conditions. On adding methanol into the reaction mixture, the strong negative polarization is observed on the *meta*-protons (7.9) of the initial compound (PDF) ($\delta_7$ = 7.46 ppm; $\delta_9$ = 7.18 ppm). Proton polarization peaks with polarization coefficient 700–750 were maximum at 20% (by volume) concentration of alcohol. After a transition period (15–20 s) the signal value remains constant and continues on the same level for many hours. Thus, a virtually constant radio-frequency radiation takes place in the course of the reversible photochemical reaction. On switching off the light the proton polarization in the initial PDF disappears.

The effects observed can be understood as the occurrence of some reversible reactions in the PDF-methanol system with associates **I**. On the excitation with light a radical pair **II** forms in a triplet state. As a result of triplet-singlet conversion the *meta*-protons (7.9) are negatively polarized.

This is confirmed by Captain rule: Γ= ++–+ < 0 [1].




**I** **II** **III**

The radical pair **II** formed is reorganized into the initial methanol and biradical structure **III** where one of the unpaired electrons is distributed in polynuclear conjugated complex similar to radical, providing the hydrogen atom transition and initial associate **I** formation.

On passing from alcohol to water the processes mentioned above were not observed that is connected with the other structure of associative complexes in a compact solvate shell in the PDF–water system.

The effects observed are one of examples of stationary radiation generation of photoreaction and can have practical application in making targets with oriented nuclei and also in industrial magnetometers.

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