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AUTHOR: Paszyc, Stefan

TITLE: The photovoltaic effect of phloxine and its silver salt in aqueous and non-aqueous solutions

SOURCE: Poznan. Uniwersytet. Zeszyty naukowe. no.40. Matematyka, fizyka, chemia. no.6. 1962. 68-81

TEXT: The work was carried out in order to study the photovoltaic effect of phloxine (sodium salt of tetrabromo-tetrachlorofluoresceine) and its silver salt in twice distilled water, aqueous solution of gelatine (0.1%), absolute alcohol and pyridine. The influence of the medium, the concentration of the dye (0.001 and 0.0001 M) and the state of dispersion on sign and value of the potential measured was studied. Changes in the potential of a platinum electrode were measured at 25°C by the compensation method in darkness, visible and ultraviolet light for the solvent, the dye solution and the silver salt solution. For aqueous and gelatine solution of phloxine only slight changes of potential were observed in both visible and ultraviolet light. More significant changes for the alcoholic solution, particularly in ultraviolet light, was

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The photovoltaic ...

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explained by the superimposition of photolysis and photooxidation of the alcohol itself and a slight photovoltaic effect of the alcohol solution of phloxine. A rise of the potential in the pyridine solutions in visible light was probably due to a change in the redox potential in the double electrical layer of the system: Pt electrode/pyridine solution of the dye and the transitional form of the dye under irradiation. Changes of the potential in aqueous and alcoholic solutions (of silver salt) were probably due to coagulation and photoaggregation of colloidal particles of the salt, photolysis of the alcohol and the salt (precipitation of metallic silver). In aqueous gelatine solution the irradiation had little influence on the electrode potential. The silver salt dissolves well in pyridine forming a solution which gives no changes of potential under the influence of irradiation. The formation of a complex salt, soluble in pyridine and insensitive to light (no change of colour or precipitation of silver after a few hours of irradiation) was postulated. There are 8 figures.

ASSOCIATION: Katedra i Zakład chemii fizycznej uniwersytetu im. A. Mickiewicza (Department and Institute of Physical Chemistry of the University im. A. Mickiewicz)

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