

# DEGRADATION RATE OF THE GRATZEL SOLAR CELL SENSITIZER N719 ON DIFFERENT TiO<sub>2</sub> SAMPLES

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The Gratzel solar cells invented in 1991 have attracted significant attention because of their high solar-to-electric power conversion efficiency and low cost compared to those of silicon solar cells. So far, there has been little research on dye degradation in cells. This work presents the degradation rate of dye (Bu<sub>4</sub>N<sup>+</sup>)<sub>2</sub>[Ru(dcbpyH)<sub>2</sub>(NCS)<sub>2</sub>]<sup>2-</sup> (N719) attached on different TiO<sub>2</sub> samples in acetonitrile under irradiation with 532-nm laser light. Analysing the solutions after irradiation using HPLC-UV-MS method, four degradation products were found: [RuL<sub>2</sub>(CN)<sub>2</sub>], [RuL<sub>2</sub>(NCS)(CN)], [RuL<sub>2</sub>(NCS)(H<sub>2</sub>O)] and [RuL<sub>2</sub>(NCS)(ACN)]. By using the relation  $k_{\text{deg}} = \phi_{\text{deg}}k_{\text{back}}$ ,  $\phi_{\text{deg}}$  quantum yield of degradation,  $k_{\text{back}}$  back electron-transfer reaction rates, the degradation rate of dye can be calculated and compared to those on P25 Degussa; ST01, ST21 and ST31 (Ishihara Sangyo Kaisa) TiO<sub>2</sub> samples.

## References

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