

PHOTOCHEMISTRY IN THE MICROWAVE OVEN: PREPARATION, EVALUATION AND APPLICATIONS OF THE ELECTRODELESS DISCHARGE LAMPS

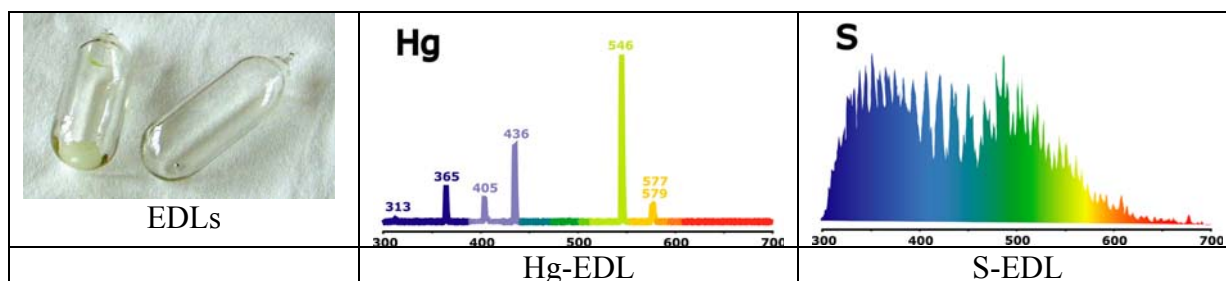
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We disclosed the studies of the microwave photochemistry [1] in an original photochemical reactor consisting of electrodeless discharge lamp (EDL) placed into the reactor vessel of a commercial microwave oven [2]. UV discharge in the lamp is generated by MW field resulting in direct simultaneous UV and MW irradiation of reaction mixture [3].

Various papers are available describing the general procedure required to produce the EDLs. However, for the sake of conciseness, many minor details are often omitted which are critical in producing a lamp that will function properly. In recent paper [4] we described the easy preparation of EDLs for photochemical applications using our original equipment.

The spectral measurements for prepared Hg and S-EDLs were accomplished in a modified MW oven described by us [5,6]. The EDL characteristics (mass of filling material, pressure of filling gas, temperature profiles of heating, minimum MW output power) were measured and will be discussed. Photochemical evaluation of EDLs has been performed on *cis-trans* photoisomerization of stilbene derivatives.



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References

- [1] P. Klán, V. Církva, *Microwave Photochemistry*, in: A. Loupy (Ed.), *Microwaves in Organic Synthesis*, Wiley/VCH, Weinheim, 2002, p. 463.
- [2] P. Klán, M. Hájek, V. Církva, *J. Photochem. Photobiol. A: Chem.* 140 (2001) 185.
- [3] P. Klán, J. Literák, S. Relich, *J. Photochem. Photobiol. A: Chem.* 143 (2001) 49.
- [4] V. Církva, L. Vlková, S. Relich, M. Hájek, *J. Photochem. Photobiol. A: Chem.* 179 (2006) 229.
- [5] P. Müller, P. Klán, V. Církva, *J. Photochem. Photobiol. A: Chem.* 158 (2003) 1.
- [6] P. Müller, P. Klán, V. Církva, *J. Photochem. Photobiol. A: Chem.* 171 (2005) 51.
- [7] Home page: <http://home.icpf.cas.cz/cirkva>