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Application of photocatalyzed reactions in the continuous microreactors successfully combines the advantages of microreactor technology with the light as the clean and traceless reagent. Thin layers in the microreactor allow effective and uniform penetration of light throughout the whole reaction volume (as expressed in the Lambert-Beer law).

Degradation of 4-chlorophenol at presence of sensitizer sulphonated zinc phthalocyanine was tested in the photo microreactor and then compared with batch reactor. The experiments were carried out in the calibrated optical bench. Therefore, both systems had the identical conditions as light source (100 W high pressure lamp), light irradiance, wavelength, pH, and temperature. The continuous photo microreactor had reaction space located between exchangeable 270 μm perfluoroalkoxy spacer and the quartz cover window. The batch reactor represented quartz glass cuvette with the internal dimensions 36 × 20 × 52 mm.

The influence of the different reactions conditions was measured and compared for microreactor and batch reactor. The batch reactor had 74 times longer light path length than the photo microreactor. Thus, the whole reaction volume in the batch reactor could not be uniformly irradiated as in case of microreactor. This fact confirmed experiments with different concentration of sensitizer. In case of microreactor higher concentration of sensitizer had positive effect on reaction rate of 4-chlorophenol degradation. But in batch reactor there was no positive effect at higher concentration of sensitizer on reaction rate.

The performance of both reactors was compared. The comparison was based on the modified reaction ratio k* between the photo microreactor and the batch reactor. The value of the k* showed approximately 5 times better performance of photo microreactor for polychromatic tests and 2 times for monochromatic tests.