

## GENERATION OF SINGLET OXYGEN BY MODIFIED NATURAL ZEOLITES AND MONTMORILLONITES

**František ŠERŠEŇ<sup>1</sup> - Stanislava PAVLÍKOVÁ<sup>1</sup> - Karol JESENÁK<sup>2</sup> - Gabriel ČÍK<sup>3</sup>**

<sup>1</sup>Institute of Chemistry, Faculty of Natural Sciences, Comenius University in Bratislava, Mlynská dolina, 842 15 Bratislava, Slovak Republic, e-mail: sersen@fns.uniba.sk;

<sup>2</sup>Department of Inorganic Chemistry, Faculty of Natural Sciences, Comenius University in Bratislava, Mlynská dolina, 842 15 Bratislava, Slovak Republic, e-mail: jesenak@fns.uniba.sk;

<sup>3</sup>Institute of Chemical and Environmental Engineering, Faculty of Chemical and Food Technology, Slovak University of Technology in Bratislava, Radlinského 9, 81 237 Bratislava, Slovak Republic, e-mail: gabriel.cik@stuba.sk

### ABSTRACT

This work deals with the generation of singlet oxygen by modified natural zeolites and montmorillonites. In the work natural zeolite from a deposit of Nižný Hrabovec (Slovak Republic) and montmorillonite from deposit of Stará Kremnička - Jelšový Potok (Slovak Republic) were used. Both natural aluminosilicates were doped with Fe<sup>3+</sup> and thiophene or pyrrole. It was found that all four forms of prepared natural aluminosilicates are able to produce singlet oxygen in chloroform suspensions under visible light. It was also found that all prepared forms of natural aluminosilicates decomposed 4-chlorophenol in water surroundings. We suppose that the singlet oxygen formation causes decomposition of 4-chlorophenol. This effect of thus modified natural zeolites and montmorillonites can be exploited to decontamination of environment polluted by chlorophenol compounds.

**Key words:** chlorophenol decomposition, montmorillonite, singlet oxygen, zeolite