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This study is focused on preparation of materials with special sorption properties and their application. These materials will be tested for removal of harmful compounds from water. Nowadays, various type of harmful substances, which belong to anthropogenic origin, occur not only in wastewater, but also in river water. The following substances were chosen for testing; some hormones such as 17α-ethynylestradiol, estradiol, estrone, and estriol and another harmful compounds; diclofenac, naproxene, and irgasan. 17α-Ethynylestradiol is pharmaceutical substance of hormonal contraception and other mentioned hormones have similar effect on a human body like estrogen. Diclofenac and naproxene belong to a nonsteroidal anti-inflammatory drug. Irgasan is used as antibacterial agent in soap, cosmetic products and toothpaste. All the above-mentioned compounds partially pass through any sewage treatment plant.

Preliminary tests were performed on 17α-ethynylestradiol and diclofenac. Two possible ways of their removal from water have been tested: photocatalytic reaction on titanium dioxide and sorption on various sorbents. Photocatalytic reaction has been performed on the titanium dioxide catalyst prepared by a sol-gel method. Titanium dioxide was coated in four layers on glass beads. The reaction has been proceeded in the presence of UV light which was generated by medium pressure mercury UV lamp. As sorbents a powdered charcoal Norit and a granulated charcoal Supersorbon were applied. For the first tests diclofenac (concentration 1 ppm) has been used. The obtained results showed a rapid removal of these compounds. Nevertheless, the work will be also focused on formation and impact of intermediates and the recovery of sorbents.