

Calibration of estrogen uptake by circulating flow system with Empore disks

Alena Otoupalíková, Jakub Urik, Zdeněk Šimek, Branislav Vrana

Research Centre for Toxic Compounds in the Environment

Endocrine disrupting compounds (EDCs) presented in the environment include wide range of naturally compounds and synthetic chemicals. Some of them are estrogenic compounds frequently founded in water matrix, especially wastewater and surface water. In fact, most of conventional WWTPs are not designed to completely eliminate these compounds.

For the improving of ecological status of all surface water bodies is the central objective of the European Water Framework Directive (WFD). The WFD has defined environmental quality criteria called Environmental Quality Standards (EQSs). In Europe, the proposed annual average EQS give 35 pg/L for 17 α -ethynylestradiol and 400 pg/L for 17 β -estradiol ¹.

As a successful approach for monitoring the water quality within a legislative framework the combination of passive sampling with sensitive analytical techniques can be considered. The objective of the study was to determine the uptake parametres of selected steroid hormones in passive samplers with Empore Disks. To describe an uptake process of compounds from water to a passive sampler the parameters such as sampling rates (R_s) and sampler-water distribution coefficient (K_{sw}) have to be calibrated. For this research, a circulating flow system developed in our laboratory was used. Sampling rates specific for each compounds were calculated using the parameters fitted after the LC-MS-MS.

¹ Proposal for a Directive of the European Parliament and of the Council amending Directives 2000/60/EC and 2008/105/EC as regards priority substances in the field of water policy