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## ENDOCRINE DISRUPTER COMPOUNDS IN WASTEWATERS AND THEIR TREATMENT

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**E**ndocrine disrupting compounds, EDCs, are recently recognized pollutants which interfere with the hormonal systems of animals. At the extreme end are known to cause gender shifts and reduced fecundity in fish. Their possible interference with the water cycle thereby affecting humans has been implicated. Current view in combating EDCs in water cycle is the multi barrier approach. Where EDCs are tackled in effluents, the environment, and in potable water supply. Therefore, information on their biodegradability and elimination is vital for sustainable strategies of the future. Five different EDCs were selected as model compounds for monitoring in seven selected treatment plants; two natural hormones: estrone and progesterone, exclusively discharged by humans. Carbamazepine, diltiazem and acetaminophen are pharmaceuticals often detected in wastewaters at ppb levels. The 24 h composite samples were analyzed in influents and effluents of various modifications of conventional activated sludge (CAS)

and one membrane, MBR (Membrane bioreactor), plant. One striking finding was the removals obtained in conventional plants, which were far exceeding those obtained in the mid-scale or lab-scale MBR plants. The hydrophilic species were found amenable to biological treatment whereas the two strongly hydrophobic chemicals (KOW>4), carbamazepine and diltiazem, were effectively removed by the CAS process mainly by sorption onto sludge, whereas the MBR plants were unable to remove these compounds from effluents, not even by sorption onto sludge. This is a cause for concern as MBRs are considered the future generation of wastewater treatment since their effluents are sparklingly clear and disinfected, hence suitable for reuse. An ozone assisted aerobic sludge digestion process developed in the lab provided >99% EDCS removal at reasonable cost.

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