

Forrez, I., Carballa, M., Noppe, H., De Brabander, H., Boon, N. and Verstraete, W. 2008) Influence of manganese and ammonium oxidation on the removal of 17 $\alpha$ -ethinylestradiol (EE2). *Water Research* (*In press*: doi10.1016/j.watres.2008.10.008).

Flow-through reactors with manganese oxides were examined for their capacity to remove 17 $\alpha$ -ethinylestradiol (EE2) at  $\mu\text{g L}^{-1}$  and  $\text{ng L}^{-1}$  range from synthetic wastewater treatment plant (WWTP) effluent. The mineral  $\text{MnO}_2$  reactors removed 93% at a volumetric loading rate ( $B_v$ ) of  $5 \mu\text{g EE2 L}^{-1} \text{d}^{-1}$  and from a  $B_v$  of  $40 \mu\text{g EE2 L}^{-1} \text{d}^{-1}$  on, these reactors showed 75% EE2 removal. With the biologically produced manganese oxides, only 57% EE2 was removed at  $40 \mu\text{g EE2 L}^{-1} \text{d}^{-1}$ . EE2 removal in the  $\text{ng L}^{-1}$  range was 84%. The ammonium present in the influent ( $10 \text{ mg N L}^{-1}$ ) was nitrified and ammonia-oxidizing bacteria (AOB) were found to be of prime importance for the degradation of EE2. Remarkably, EE2 removal by AOB continued for a period of 4 months after depleting  $\text{NH}_4^+$  in the influent. EE2 removal by manganese-oxidizing bacteria was inhibited by  $\text{NH}_4^+$ . These results indicate that the metabolic properties of nitrifiers can be employed to polish water containing EE2 based estrogenic activity.