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Removal of Androgens and Estrogens from Water by Reactive Materials

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ABSTRACT

Nowadays, endocrine disruptor compounds in the water system have become a concern due to the risk of contamination to wild life and humans even at the nanogram level. Excess estrogens and androgens are a major contributor group of endocrine compounds. Statistical surveys have shown that dairy farms contribute to over 90% of the total estrogens in the UK and US. Reporter gene assays (RGAs) is being developed to assess the efficiency of reactive materials to remove target hormonal contaminants from dairy farm wastewater. This study demonstrates that 2 g of reactive materials (granular activated carbon (GAC), zero-valent iron (ZVI) and organoclay) efficiently removed over 50% of 17β-estradiol and 92% Testosterone over a 24 h period from 20 ml of HPLC grade water spiked at a concentration of 1000 ng l-1. Therefore, these materials may be useful adsorbents for the advanced treatment of residual natural hormones in dairy farm wastewater.

KEYWORDS

Dairy Farm Wastewater, Natural Hormones, Reactive Materials, Reporter Gene Assay

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