



## Removal of polycyclic aromatic hydrocarbons from municipal sludge using UV light

Nezih Kamil Salihoglu, Gizem Karaca, Güray Salihoglu, Yücel Tasdemir\*

*Environmental Engineering Department, Faculty of Engineering and Architecture, Uludag University, Bursa 16059  
Tel. +90 224 2942118; Fax: +90 224 4429148; email: tasdemir@uludag.edu.tr*

Received 15 March 2011; Accepted 23 February 2012

---

### ABSTRACT

This study includes research into using UV light to remove Polycyclic Aromatic Hydrocarbons (PAHs) from municipal sludge. The effectiveness of  $\text{TiO}_2$  as a photocatalyst on this UV application was also determined. Sludge samples that were taken from an urban wastewater treatment plant (UWWTP) were exposed to UV-C light in a specially designed setup. The total concentration of  $\Sigma_{12}$  PAH in the sludge, which was  $1339 \text{ ng g}^{-1}$  of dry matter initially, decreased by 2–77% after 24 h of UV application. The concentrations of some PAH isomers increased after the UV application, which revealed that isomer transformations could emerge due to the effects of temperature and photodegradation. UV light was found to remove 3-ring light compounds more effectively than 4–6-ring heavy compounds. A total PAH decrease of 77% was achieved by adding an amount of  $\text{TiO}_2$  equal to 0.5% of the dry weight of the sludge although the removal rate of PAHs from the sludge decreased when the  $\text{TiO}_2$  dosage was increased. It is possible that the decreased number of titanium particles caused UV light to scatter and be absorbed in the reaction environment.

*Keywords:* Municipal sludge; PAH; UV-C;  $\text{TiO}_2$ ; Temperature; Treatment

---

---

\*Corresponding author.