

# Recovery of Titania (TiO<sub>2</sub>) from Waste-Sludge of Majmaah Water Treatment Plant

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## Abstract

Treatment of water using flocculation process for prevention of pollutions was commenced to meet stringent disposal standards. However, dispose of large amounts of waste-sludge from Water Treatment Plants (WTPs) is considered as one of the most costly and environmentally challenges. Recent studies, in the Kingdom of Saudi Arabia (KSA), indicated that huge amount of waste-sludge is produced from various WTPs using synthetic polymers or conventional flocculants. Until now, the most commonly ways for sludge disposal are landfilling or sea-dumping which are environmentally dangerous. Thus, this research used a novel technique of Titanium (Ti)-salt flocculation instead of polymer flocculation in Majmaah City WTP to resolve the problem of waste-sludge and to produce Titania nanoparticles from the waste-sludge as a by-product. Results indicated that Ti-salt showed better results for pHs, turbidity, iron (Fe) and phosphorous (P) compared with the polymer. Moreover the waste-sludge of Ti-salt flocculation was incinerated and produced useful TiO<sub>2</sub> nanoparticles, while the polymer-sludge was dried then dumped.

