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Title: Comparison Between Biological Treatment and Chemical Precipitation for Nitrogen Removal from Old Landfill Leachate

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Abstract: The study reports the results of a laboratory scale investigation aimed at evaluating the effectiveness of mature municipal landfill leachate treatment by a biological stage (used SBBR as a biological treatment) and Chemical precipitation (Used MAP precipitation (magnesium ammonium phosphate)) to study the nitrogen removal capabilities for treatment of sanitary landfill leachate containing high ammonia concentration, and the comparison between them. The monitored sample taken from the Chang Sheng bridge landfill site in Chongqing city-China, has its concentrations of COD, BOD5, and NH3-N about 1650, 75 and 1100 mg/l respectively. The results from SBBR showed that after two months long period of domestication and one month period of stability, the ammonia nitrogen removal efficiency reached to 99% in the SBBR reactor, at nitrogen loading rate 0.51 kg TN/m3 per day and HRT was 9 hours, met to Chinese standards for discharge. The results of the MAP precipitation was technically effective to remove the high NH3-N strength of over 1100 mg/l from the raw leachate at molar ratio of Mg2+: NH4+: PO4-3 of 1:1:1, they demonstrated a very satisfactory removal of ammonia; an initial NH3+-N concentration of 1100 mg/l contained in the raw leachate was quickly reduced to 28 mg/l within 15 min, while the pH producing a maximum removal of ammonia was 9.0. The percent removal of ammonia after treatment by MAP was 97.5%.