EuroSciCon

4th Edition of International Conference on

Environmental Science & Technology 2018

March 29-31, 2018
Vienna, Austria

Zhiqiang Zhang et al., J Environ Res, Volume 2

ELECTROCHEMICAL–CATALYTIC REDUCTION OF NITRATE OVER PD–CU/γAL_2O_3 CATALYST IN CATHODE CHAMBER: ENHANCED REMOVAL EFFICIENCY AND N_2 SELECTIVITY

Zhiqiang Zhang, Wenxin Shi and **Fuyi Cui**
Harbin Institute of Technology, China

The Pd–Cu/γAl_2O_3 catalysts were prepared by impregnation method and introduced into the cathode chamber of a divided electrochemical denitrification cell with two graphite plates as the cathode and anode, to enhance the nitrate removal efficiency and N_2 selectivity. The Pd–Cu/γAl_2O_3 catalysts were characterized by transmission electron microscope (TEM), x–ray diffraction (XRD), specific surface area measurements using BET and inductively coupled plasma–atomic emission spectrometry (ICP–AES). In the rationally designed electrochemical–catalytic (ECC) system, the as–prepared catalyst could significantly enhance the nitrate degradation rate to 1.08 mg/L at current density of 10 mA/cm², which was approximately 2.5 times compared with the electrochemical (EC) system without catalysts adding in. Additionally, a higher nitrogen selectivity of 80.37% was obtained under the same experiment condition. The improved performances were likely due to the presence of a catalytic reduction reaction of nitrate with the appropriate amount of hydrogen generated by electrolysis as reductant. Significantly, the current efficiency was calculated and enhanced value of 20% to 40% (depended on current density) was obtained in the ECC process with a catalyst content of 1.0 g/L.

Biography

Zhiqiang Zhang is a PhD student from School of Municipal and Environmental Engineering, Harbin Institute of Technology. His research direction is novel catalyst development and application in the field of environmental science and technology, especially in the removal of oxyanion, such as nitrate, perchlorate and bromate from water by catalytic hydrogenation reduction method using Pd- or Pt-based catalyst.

zhangzq2013@yeah.net