

Reduction of nitrate in groundwater by hematite supported bimetallic catalyst

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Abstract

In this study, nitrate reduction of real groundwater sample by 2.2%Cu-1.6%Pd-hematite catalyst was evaluated at different nitrate concentrations, catalyst concentrations, and recycling. Results show that the nitrate reduction is improved by increasing the catalyst concentration. Specific nitrate removal by 2.2%Cu-1.6%Pd-hematite increased linearly with the increase of nitrate concentration showing that the catalyst possesses significantly higher reduction capacity. More than 95% nitrate reduction was observed over five recycles by 2.2%Cu-1.6%Pd-hematite with ~56% nitrogen selectivity in all recycling batches. The results from this study indicate that stable reduction of nitrate in groundwater can be achieved by 2.2%Cu-1.6%Pd-hematite over the wide range of initial nitrate inputs.

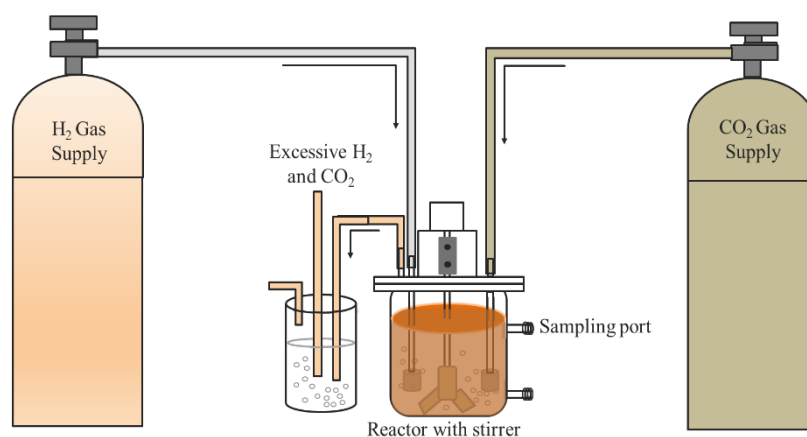


Fig. 1 Schematic of reactor system

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Note: A manuscript submitted to Advances in Environmental Research April, 2016