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# Palladium nanoparticles supported on amine-functionalized glass fiber mat for fixed-bed reactors on the effective removal of hexavalent chromium by catalytic reduction

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Palladium nanoparticles were deposited on the amine-grafted glass fiber mat (GFM-NH<sub>2</sub>) catalyst support by a conventional impregnation process followed by the borohydride reduction in aqueous solution at room temperature to create the designed Pd/GFM-NH<sub>2</sub> catalyst. By the use of large size glass fiber mat without nano/mesopores as the catalyst support, the internal mass transfer limitations due to the existence of nano/mesopores on the catalyst support were eliminated and the Pd/GFM-NH<sub>2</sub> catalyst could be easily separated from treated water due to the large size of the catalyst support. Batch experiments demonstrate its good catalytic reduction performance of Cr(VI) with formic acid as the reducing agent. It also demonstrated an efficient Cr(VI) removal and stability in a lab-prepared, packed fixed-bed tube reactor for the continuous treatment of Cr(VI)-containing water. Thus, it has a good potential for the catalytic reduction of Cr(VI) in the water treatment practice.

*Keywords :* Palladium nanoparticle, Amine-functionalized glass fiber mat,

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