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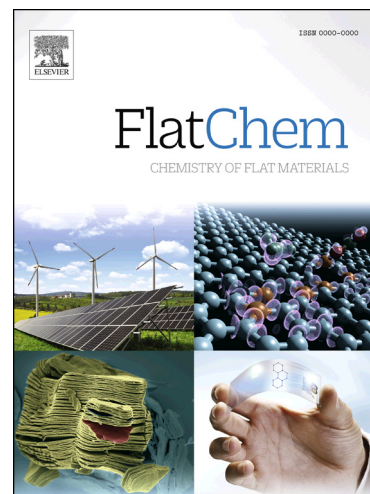
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Nitrogen-doped graphene: effect of graphitic-N on the electrochemical sensing properties towards acetaminophen

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Abstract

Graphitic-N-rich nitrogen-doped graphene (NGE-A) and graphitic-N-free nitrogen-doped graphene (NGE-U) were synthesized via a hydrothermal reduction of graphene oxide with the doping agents 2-aminopyridine and urea. XPS spectra of the synthesized products revealed the formation of pyridine-N, pyrrole-N, and graphitic-N was observable exclusively in the NGE-A. Compared with NGE-U, NGE-A exhibited higher electrocatalytic activity for the redox of acetaminophen. It appeared that the major difference between NGE-A and NGE-U was the graphitic-N, so it was concluded that the graphitic-N in the NGE-A played a key role in the electrochemical process, which resulted in the improved electrocatalysis. Furthermore, when NGE-A was used in the determination of acetaminophen, it exhibited a low detection limit of 0.38 μM .

Keywords: graphitic-N; nitrogen-doped graphene; acetaminophen; electrochemical determination.

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