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Effectiveness of Multi-Walled Carbon Nanotubes and activated Carbon for capturing E. coli 0157: H7 for application in water filtration (Article)

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Abstract

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The ability of unmodified and functionalized Carbon Nanotubes (MWCNTs) to capture Escherichia coli 0157:H7 from water was tested and compared with Activated Carbon (AC). This study aims to test the effectiveness of these materials to filter out this bacteria strain. Chemical oxidation was used to functionalize MWCNTs to achieve the desired oxygenated functional groups which was analysed with Fourier Transform Infrared spectroscopy (FTIR). Field Emission Scanning Electron Microscopy (FESEM) was used to verify bacteria capture after water filtration on both functionalized and unmodified MWCNTs and AC, respectively. Results showed that the bacteria were captured on functionalized MWCNTs and unmodified AC, however, the bacteria were not detectable on unmodified MWCNTs and functionalized AC. The results indicate that the presence of specific carboxyl functional groups on the surface of functionalized MWCNTs and morphology of the unmodified AC is relevant for Escherichia coli 0157:H7 capture. © Medwell Journals, 2018.

Author keywords

Activated Carbon (AC) | Capture | Carbon-based nanomaterials | Escherichia coli 0157:H7 | Functional groups | Functionalized Multi-walled Carbon Nanotubes (MWCNTs)

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