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Organic contaminants and carbon nanoparticles: sorption mechanisms and impact parameters

Key words: Organic contaminants, Environmental behaviors, Carbon nanoparticles, Interaction mechanisms

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Introduction

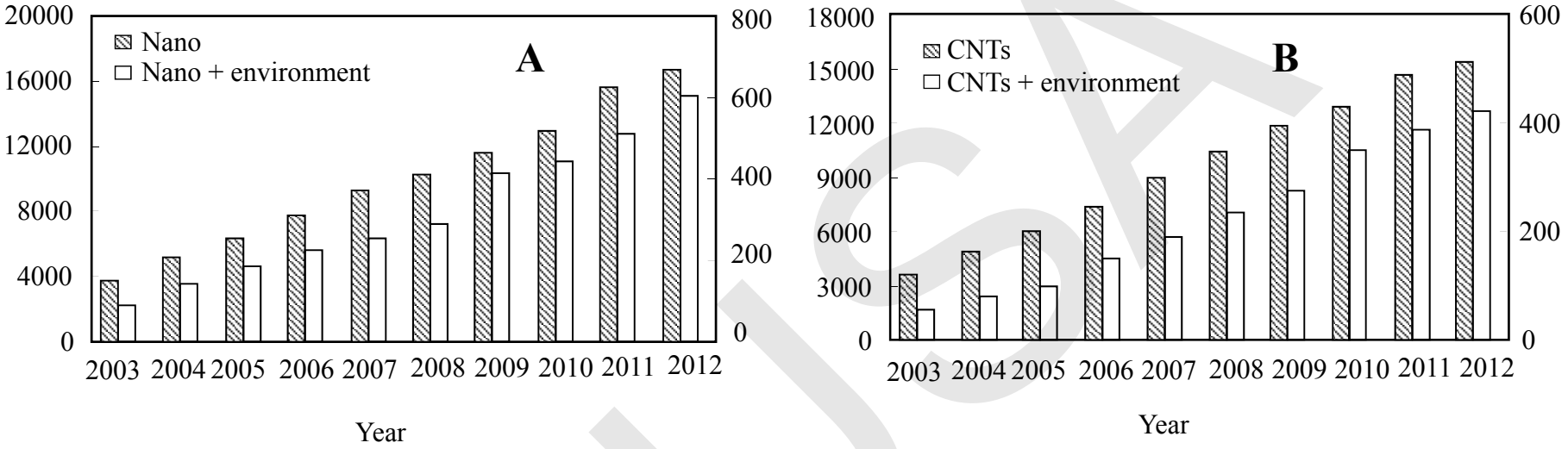

Figure 1. Total amount of papers with the topic of "nano", "nano + environment" (A) and "carbon nanotubes", "carbon nanotubes + environment" (B) in Web of Science.

The total amount of nanotechnology or CNP relevant papers increased in resent 10 years, indicating that nanotechnology is rapidly developing as the most promising new technologies in the 21st century. These results also indicating that more and more attentions are paid to the environmental behaviors, fate and risk assessment of CNPs.

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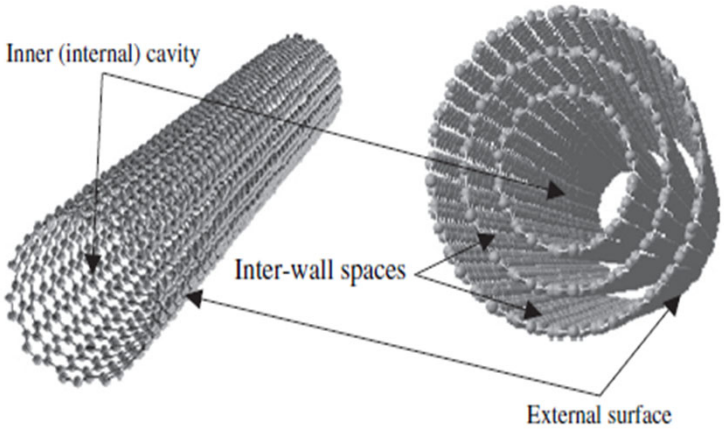
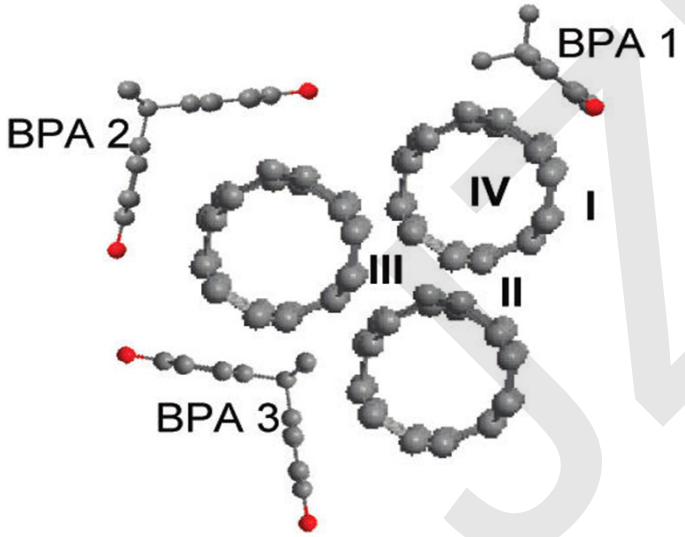
Purpose





Carbon nanoparticles (CNPs)
Unique properties
Wide potential applications

Enter into environment

Strong interaction between organic contaminants and CNPs

Adsorption mechanisms

Impact parameters

Environmental behaviors and risks investigating of organic contaminants and CNPs

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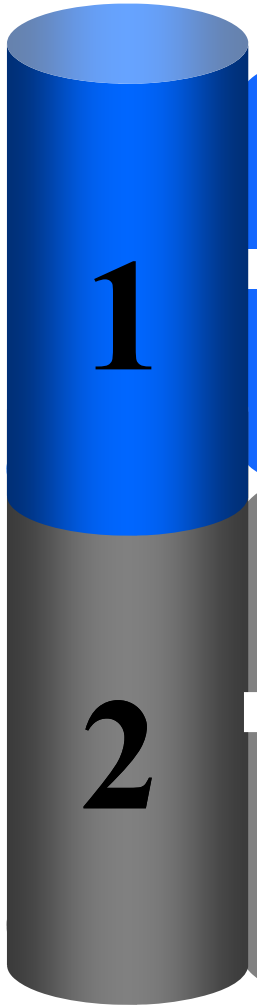
Innovation



Systematical investigating the surface properties and morphology of CNPs and the molecular size, structures and functional groups of organic contaminants for the sorption of organic contaminants on CNPs.

Interactions between organic contaminants and CNPs may simultaneously control the sorption progress. This study investigate the primary sorption mechanisms or the relative contribution of different mechanisms to overall sorption.

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Results and Conclusions

1. Sorption of organic contaminants on CNPs were influenced by the surface properties and morphology of CNPs and the molecular size, structures and functional groups of organic contaminants.

2. Hydrophobic, electrostatic, hydrogen bond and π-πinteractions may simultaneously control the sorption progress of organic contaminants on CNPs, while the sorption controlling mechanisms may differ under different environmental conditions.

3. Investigating the primary sorption mechanisms or the relative contribution of different mechanisms to the overall sorption is vital in predicting the environmental behaviors of both organic contaminants and CNPs and their associated risks.

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Related Papers

Papers	Journal	IF
Hongbo Peng, Bo Pan, Min Wu, Ying Liu, Di Zhang, and Baoshan Xing. Adsorption of ofloxacin and norfloxacin on carbon nanotubes: hydrophobicity- and structure-controlled process	Journal of Hazardous Materials	3.925
Hongbo Peng, Bo Pan, Min Wu, Ran Liu, Di Zhang, and Baoshan Xing. Adsorption of ofloxacin on carbon nanotubes: solubility, pH and cosolvent effects	Journal of Hazardous Materials	3.3925
Hongbo Peng, Hao Li, Chi Wang, Di Zhang, Bo Pan, and Baoshan Xing. Sorption and solubility of ofloxacin and norfloxacin in water-methanol cosolvent	Chemosphere	3.137

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