

Carbon-Based Nanomaterials for Advanced Water Treatment Technologies

Science fiction fans of the 20th century may be disappointed because flying cars did not replace automobiles or talking robots are not our loyal butlers. But we are fully immersed in extremely sophisticated technologies in our daily lives that we can barely catch up. These technologies allow us to send video messages from our seats in an airplane over 35,000 feet flying above the Atlantic Ocean. We can cure diseases that were deadly 30 years ago or develop vaccines within months. We can solve crimes using advanced analytical tools that were unsolvable a few decades ago. We use highly precise gene editing tools. Quantum computing is not a dream anymore. James Webb Space Telescope is performing high resolution and sensitive visualization of objects from the edge of the universe. The list can go on and on. However, when it comes to securing our access to safe drinking water, the technologies, and materials we rely on are outdated and inefficient. In this presentation, I will focus on recent technological advances for water treatment industry, which aspire to contribute to efficient, safe, and sustainable water treatment. Specifically, I will discuss (i) developing free energy relationships for removal of low molecular weight synthetic organic compounds from water by carbon nanomaterials, (ii) edge-tailoring regenerable carbon nanomaterials, and (iii) generation of electrospun carbon/polymer composites.

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