Electronic Supplementary Material (ESI) for Nanoscale Advances.

Water Impact Statement

Water is a vital resource for life, and its quality directly impacts the well-being of ecosystems and human communities alike. Our manuscript, "Sequestration of chromium (VI) and nickel (II) heavy metals from unhygienic water via sustainable and innovative magnetic nanotechnology," underscores the critical role that innovative water treatment technologies can play in addressing pressing environmental concerns. The contamination of water sources with toxic heavy metals represents a significant threat to both environmental and human health. Chromium (VI) and nickel (II) are known to be highly detrimental when present in water supplies, as they can accumulate in ecosystems, harm aquatic life, and pose severe health risks when consumed by humans. Our research presents a sustainable and efficient method for mitigating this threat by removing these hazardous contaminants from water sources.

The impact of our research on water resources is multifaceted:

1. **Water Safety**: Our methodology offers a reliable and sustainable approach to safeguarding water quality by removing toxic heavy metals. This directly contributes to providing safe and clean drinking water for communities worldwide.

2. **Ecosystem Protection:** By preventing the release of chromium (VI) and nickel (II) into natural water bodies, our research helps preserve aquatic ecosystems and the biodiversity they support. This is essential for the health and balance of aquatic environments.

3. **Environmental Sustainability:** The use of magnetic nanotechnology in our approach reduces the environmental footprint of water treatment processes. It minimizes the need for chemical additives and energy-intensive methods, aligning with the principles of sustainable water management.

4. **Innovation and Progress:** Our work exemplifies the innovative potential of nanotechnology in addressing complex water-related challenges. It sets a precedent for future research and encourages the development of eco-friendly and efficient water treatment technologies.

In summary, our manuscript underscores the critical importance of sustainable and innovative approaches to water treatment in safeguarding water resources, protecting ecosystems, and ensuring the well-being of communities. By removing hazardous heavy metals from unhygienic

water sources, our research contributes to the broader effort to secure a clean and sustainable water supply for all and advances our understanding of environmentally responsible water management practices. We believe that the dissemination of our findings in Environmental Science: Water Research & Technology will serve as a catalyst for further research and inspire new solutions to address water quality challenges on a global scale.

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