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Innovative water treatment technology for removal of micropollutants using membrane process

Sachin

CSiR- National Physical Laboratory, India

Statement of Problem: Water is basic need of all living animals. Every living creature drinks water for the survival. The drinking water should be pure and free from contaminants. But today almost 40% of the total population is facing drinking water crises. The main cause of this crises is impure drinking water i.e. drinking water available contains contaminants. Intake of such contaminated water will result in several health issues and even causes death. Water mainly contains organic (dyes, pesticides, antibiotics) and inorganic (heavy metals) contaminants. Main sources of these contaminants in water are industrial waste such as waste from tannery industries, paint industries, chemical industries and metallurgical industries etc. The rapid growth of these industries result in the contamination of water bodies at an alarming rate. To keep our water resources safer for future generation, there is an utmost requirement for the development of an innovative technology to remove micropollutants. Carbon Nanotubes(CNTs) are widely used in water treatment due to its excellent structural and surface functionality. Further membrane processes increases the efficiency of the process for removal of micropollutant. This CNTs based universal adsorbent would be coupled with a membrane, such as those employed for nanofiltration (NF), electrodialysis (ED) or membrane bioreactor (MBR) to increase their efficacy by selectively removing a variety of pollutants. This technology is very efficient for the removal of unidentified contaminants which are not monitored in the absence of stringent regulation specific to these contaminants.6 Developing an affordable and effective treatment of contaminated water is critical to both on individual microscale and government macroscale.

Thus, the objective of the present work is to develop an innovation water treatment technology for removal of micropollutants using membrane processes.

Recent Publications

1. Grégorio, C.; Pierre-Marie,B. Progress in Polymer Science. 2018, 33, 39.
2. Uppal, H.;Hemlta;Tawale, J.;Singh, N.J. Enviro. Chem. Eng. 2016, 4, 2964.
3. Xuemei, R.; Changlun, C.; Masaaki, N.; Xiangke, W. Chem. Eng. J. 2011, 170, 395.
4. Bolong, N.; Ismail, A.F.; Salim, M.R.; Matsuura, T. Desalination. 2009, 239, 22.
5. Sergios, K. Papageorgiou; Fotios, K. Katsaros; Evangelos, P. Kouvelos; John, W.Nolan; Herve, Le Deit, Nick, K. Kanellopoulos. J. Haz. Mat. 2006, 137, 17655.

Biography

Sachin have experience on functionalizing zinc peroxide, chitosan, and alginate-based adsorbents for the removal of micropollutants from contaminated water. Functionalized zinc peroxide and alginate-based adsorbents show great efficiency for removing heavy metals, notably arsenic, lead, etc. The chitosan-based adsorbents efficiently removed organic contaminants such as dyes. Currently, he is working on Carbon Nanotubes. Carbon nanotubes are extensively used in water treatment processes because of their excellent structural and surface functionality making them a potentially potent adsorbent for the removal of micropollutants.

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