

ZnO-polymer-based membranes for wastewater treatment and environment protection

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Since they can cause skin rashes, genetic abnormalities, disorientation, gastrointestinal problems, and respiratory allergies, organic pollutants and water contaminants continue to pose a serious threat to human health [1]. For instance, in textile industry, large amounts of organic dyes contaminate water[2]. This represent a tremendous hazard considering that some of the dye agents are rated as toxic compounds with carcinogenic effects and extremely low biodegradability[2].

Despite the fact that metal oxides like TiO₂ and ZnO are greatly used in the photocatalytic degradation for wastewater decontamination due to their high natural abundance, semiconducting properties, and reduced toxicity a lot of attention was given to design new materials/composites to improve their photocatalytic and antimicrobial activity to enhance contaminated water sanitation processes[3, 4].

The main purpose of these studies involves the design of synthetic and natural-based polymer membranes modified with inorganic nanoparticles like ZnO for removal of organic water contaminants through photocatalytic/antimicrobial processes.

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References

1. Järup, L. Hazards of heavy metal contamination. *British Medical Bulletin* **68**, 167 (2003).
2. Kaur, J., Bansal, S. & Singhal, S. *Physica B: Condensed Matter* **416**, 33 (2013).
3. Rusen, E.; Mocanu, A.; Nistor, L.C.; Dinescu, A. *et. al.. ACS Applied Materials & Interfaces* **6**, 17384-17393 (2014).
4. Mocanu, A.; Rusen, E.; Diacon, A.; Isopencu, G. *et.al. Materials Chemistry and Physics* **223**, 39-45, (2019).