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## **New Innovation of Kappa-carrageenan Encapsulating Magnetite Nanoparticles in Removing Heavy Metals from Wastewater**

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The COVID-19 pandemic has posed a huge challenge to country and all community in the worldwide. It heightens the importance of good personal hygiene and good water quality which are indispensable to protect the health of all living organisms and environment. In wastewater treatment, adsorption was suggested to be the most efficient application in eliminating pollutants and heavy metals with high removal rates. Besides, seaweed *Kappaphycus alvarezii* has proved with capability in removing contaminants by absorption. Hence, this study aims to evaluate the efficiency of nanocomposite adsorbent surface modified with *K. alvarezii* carrageenan in removing heavy metals in wastewater. The magnetite nanoparticles ( $\text{Fe}_3\text{O}_4$ ) were prepared using co-precipitation and surface coating with  $\kappa$ -carrageenan from *K. alvarezii* with pH 3, 5, 7, 9 and 12 to serve as biofilter in wastewater treatment. Water quality testing were carried out to determine the efficiency of adsorbents to removal copper ions ( $\text{Cu}^{2+}$ ). Adsorption capacity (mg/L) and the percentage of  $\text{Cu}^{2+}$  removal was calculated. Analysis results showed that adsorption capacity of  $\kappa$ -carrageenan- $\text{Fe}_3\text{O}_4$  adsorbent with pH 3 showed the highest adsorption with 2.97mg/L to remove  $\text{Cu}^{2+}$  in the wastewater. The percentage of  $\text{Cu}^{2+}$  removal in the wastewater had reached 90%. This might be the combination of negatively charged  $\kappa$ -carrageenan and positively charged  $\text{Fe}_3\text{O}_4$  are well coated in pH 3 and achieved the capability to attract the pollutants with their specific functional groups. A good water quality is essential in our daily lives which provides a safe and healthy water source to the community and the environment.

### **Biography:**

Regina from Malaysia, currently a postgraduate student that study on significance of seaweed as biocomponents for sustainable bioproducts and byproducts. She has studied on designing a prototype from byproduct in wastewater treatment which really reducing the pollutants from the polluted water. As we all knew, most of the wastes are ended up in the landfill which resulting in insufficient landspace and release contaminants to the environment. Hence, Her aim to make our environment better and safe for all the living organisms to sustain their lives through my research contributions.