Development of Green Mussels Granules Coated with Actives from Oil Palm Empty Fruit Bunch Extract as A Natural Coagulant

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This research is motivated by blooming algae cases caused by the poor water conditions in Indonesia. Researchers developed green mussels' shells powder coated with oil palm empty fruit bunch extract to coagulate the anion and cation wastes. The objective of this study was to test the ability of green mussels' shells powder coated with oil palm empty fruit bunch extract in absorbing cations (Fe2 +) and anions (MnO4- and PO43-) wastes. The result from the PSA test shows that the particles of pure green mussels' shell powder are more uniform to each other, but it has larger particle size, as seen from a larger diameter of particle. From SEM-EDX test, it can be seen that the coating process decreases the weight composition of calcium from 38% to 7.23% while increasing the percent weight of both C and O from 19.04% to 48.27% and 42.96% to 44.50% respectively. XRD data shows that the coating process changes the CaCO3 structure from rhombohedral to orthorhombic. Since orthorhombic has less contact points, it has more surface area. This increases the adsorption capability of the coated mussel shell powder. It was also found that iron(II) cation wastes were best adsorbed by 0.6% concentration of coated green mussels' shells powder after ultrasonification process with effectiveness of 61.09%. While, permanganate(VII) and phosphate anions best adsorbed by 0.6% concentration of pure green mussels' shells powder after ultrasonification process with effectiveness of 80,07% and 70.21% respectively. Based on these results, pure green mussels' shells powder after ultrasonification process can be used to absorb anion wastes, while the green mussels' shells powder coated with oil palm empty fruit bunch extract after ultrasonification process can be used as cation wastes adsorbent.

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