ABSTRACT

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STUDY OF STABILITY, ANTIOXIDANT ACTIVITY, AND BINDING CAPACITY OF ANTIOXIDANT-COATED-MAGNETITE NANOPARTICLES
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Fe3O4 (Magnetite) nanoparticles (MNPs) was known to possess magnetic properties and has been utilized as carrier due to its ability to cross blood brain barrier. In this research, functional compounds such as curcumin, xanthones, and ascorbic acid are utilized as the coating material for MNPs. Antioxidant activity, binding capacity, and stability of the nanoparticles were observed. The use of TEOS was proven to alter the stability of MNPs and increase the binding capacity of MNPs. Xanthones-coated MNPs with addition of TEOS contained the lowest IC50 of 8.7589 mg/L. Followed by Ascorbic acid-coated MNPs with TEOS with IC50 of 42.3919 mg/L and curcumin-coated MNPs with TEOS with IC50 of 109.7743 mg/L. In terms of binding capacity, xanthones-coated MNPs with TEOS contain the highest binding capacity of 97.5625%, followed by ascorbic acid-coated MNPs with TEOS (96.8354%) and curcumin-coated MNPs with TEOS (91.8830%). Highest stability was found in xanthones-coated MNPs with TEOS with the lowest mean release of 0.5182, followed by curcumin-coated MNPs without TEOS (1.0309) and Ascorbic acid-coated MNPs with TEOS has the highest mean release of 20.2341 The obtained MNPs were found to have A size range between 54.3-68.3 nm with the average size of 65.7 nm.

Keywords: Antioxidant activity, Binding capacity, Magnetite, Nanoparticle, Stability