Comparative study of ultrasonic and hydrothermal methods for the preparation of the *Camellia oleifera* shell inhibitor

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Abstract China is a major producer and consumer of *Camellia oleifera*, constituting more than 90% of global production. *Camellia oleifera* shells (COS) accounted for 50% ~ 60% of *Camellia oleifera*. Utilizing COS sensibly can reduce environmental contamination and enhance the circulating economy. Ultrasonic extraction and hydrothermal methods were used to prepare corrosion inhibitors with COS as raw material. The advantages and disadvantages of the two methods and the mechanism of action were compared in detail. The results show that the ultrasonic extracted inhibitor (COSE), had a short preparation time and great corrosion inhibition effect (90.5%, 1000 mg L^{-1}), but with a large dosage. Carbon dots (CDs) obtained from the optimized preparation by the hydrothermal method can be used in 2/3 less amount and have slightly higher anti-corrosion properties (91.6%, 300 mg L^{-1}), as confirmed by the results of the various tests. Moreover, CDs have excellent fluorescence characteristics than COSE, providing a good prospect for development. The results of this research can offer some reference value for the utilization and exploration of biomass resources.

Keywords: Corrosion inhibition; *Camellia oleifera* shells; Ultrasonic extraction; Hydrothermal method; fluorescence

Reference

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