

REVIEWER'S REPORT

Manuscript No.: **IJAR-53718**

Date: 8-09-2025

Title: Adsorption of chromium on activated carbon produced from agri-food waste

Recommendation:

Accept

Rating	Excel.	Good	Fair	Poor
Originality	Yes			
Techn. Quality		Yes		
Clarity		Yes		
Significance		Yes		

Reviewer Name: Dr. Ashish Yadav

Date: 8-09-2025

Detailed Reviewer's Report

Reviewer's Comment for Publication.

ACCEPTANCE

The paper titled "*Adsorption of chromium on activated carbon produced from agri-food waste*" presents a timely and well-structured analysis.

The following points justify the acceptance of this manuscript:

1. Introduction

- The study addresses a relevant environmental problem — removal of toxic chromium from wastewater which is aligned with global sustainability and waste valorization goals.
- The innovative use of agri-food waste biomass as raw material for activated carbon production makes the work significant in both waste management and water treatment contexts.

2. Literature Review

- The review highlights gaps in previous studies, particularly the limited exploration of chromium adsorption on activated carbon derived from specific agricultural residues like *Balanites aegyptiaca*, *Hyphaene thebaica*, and *Zizyphus mauritiana*.
- It establishes a strong foundation by connecting adsorption kinetics, surface chemistry, and pH influence with prior work, ensuring continuity with existing knowledge.

3. Solution Approach / Methodology

International Journal of Advanced Research

Publisher's Name: Jana Publication and Research LLP

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- The paper employs a scientifically sound experimental design, including chemical activation with H_3PO_4 and H_2SO_4 , Boehm titration, pHPZC determination, MB adsorption, and chromium adsorption kinetics.
- The inclusion of comparisons with commercial activated carbon (CA-C) strengthens the reliability of the findings and validates the practical relevance of the developed carbons.

4. Results and Discussion

- Results demonstrate high chromium adsorption efficiency, with adsorption kinetics fitting Elovich models and diffusion analysis providing mechanistic insights.
- The developed carbons show better performance than commercial activated carbon, confirming the novelty and utility of the proposed materials.

5. Conclusion and Contribution

- The study concludes with practical applicability: agri-food waste can be converted into low-cost, high-performance adsorbents for heavy metal remediation.
- The work contributes to both environmental protection and circular economy practices, making it suitable for acceptance in journals focused on adsorption, waste valorization, or environmental engineering.

Overall, the manuscript is well-motivated, clearly written, and contributes meaningful insights into an increasingly vital area of research. It is recommended for acceptance.