

REVIEWER'S REPORT

Manuscript No.: IJAR-53387

Date: August 16, 2025

Title: Alternative Sources of Potassium from Potassium Feldspars, from Mining to Cropping: A Review,

Recommendation:

Accept as it is

Accept after minor revision.....

Accept after major revision

Do not accept (*Reasons below*)

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

Reviewer Name: Dr Lakhdar Guerine

Date:

Detailed Reviewer's Report

This review examines activation technologies for potassium feldspars to produce controlled-release fertilizers, analyzing four main approaches: mechanochemical, thermal (roast-leach), alkaline hydrothermal, and biological. Alkaline hydrothermal treatments and pyrometallurgical chlorination achieve the highest extraction efficiencies (>80-90%), while mechanical and biological approaches offer environmental advantages with reduced energy demand. Agronomic trials demonstrate that properly activated feldspars can match conventional KCl performance while providing controlled nutrient release and prolonged residual effects. The study highlights Brazil's strategic potential to exploit domestic feldspar deposits to reduce dependence on potassium fertilizer imports (>90%). This integrated approach could enhance self-sufficiency and resilience in agricultural production systems while offering sustainable alternatives to conventional fertilizers.

Strengths

- 1) Comprehensive technological approach - Systematic analysis of multiple activation pathways (mechanical, thermal, hydrothermal, biological) with quantitative extraction efficiency data.
- 2) Economic and strategic relevance - Addresses a crucial geopolitical issue (import dependence) with focus on Brazilian domestic resources.

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- 3) Integrated multidisciplinary perspective - Effectively covers the complete chain from mineralogy to agronomic applications and environmental impacts.

Weaknesses

- a) Lack of original experimental data - Primarily limited to bibliographic synthesis without providing new experimental data or in-depth critical analyses.
- b) Absence of detailed techno-economic evaluation - Despite mentions of economic analyses, lacks precise quantitative comparisons between different technologies.
- c) Insufficiently rigorous review methodology - Study selection criteria poorly detailed and absence of critical analysis of cited source quality.