

REVIEWER'S REPORT

Manuscript No.: IJAR-56888

Title: Determination of Uranium in Phosphate Industry Effluents Using WDXRF: Concentration Assessment and Environmental Implications

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's ID: JPR-171

Detailed Reviewer's Report

This study applies WDXRF for uranium determination in phosphate industry effluents and reports concentrations around 10 ppm with moderate reproducibility. While the topic is relevant and WDXRF offers potential for rapid monitoring, the manuscript suffers from significant methodological and presentation weaknesses that require major revision. First, no calibration information is provided the study lacks details on standard preparation, calibration curve range, linearity, limit of detection, or limit of quantification. Without these, the reported 10 ppm values cannot be properly validated. Second, the study claims “no prior sample preparation” yet filtration and homogenization are described; moreover, no matrix matching or internal standardization is discussed, raising concerns about accuracy given the complex effluent matrix. Third, the coefficient of variation of 4% is presented as “moderate reproducibility,” but no replicate measurements per sample or statistical treatment are detailed. Fourth, the environmental implications section is superficial the paper does not compare measured uranium levels against national or international discharge limits (e.g., WHO, EPA, or local Tunisian standards), nor does it assess seasonal or process-related variability. Fifth, the methodology mentions ICP-OES only in the introduction but never uses it for validation or cross-checking WDXRF results, which is a critical omission for a method development study. Sixth, the references include many sources from 2020-2023 that appear generic or misdated (e.g., “Langmuir, 2022” citing a classic text likely older). Finally, the single peak detection figure lacks error bars, baseline details, and spectral interferences discussion. Major revisions must address calibration, validation against a reference method, quality control (blanks, spikes, certified reference materials), and a substantive environmental risk assessment. Only then can the manuscript be reconsidered.