



Utilising Chemical Engineering Processes for Local Phosphate Production Resource Utilization in Morocco

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Abstract

Morocco is a phosphate-rich country, which has significant local resources that can be utilised through chemical engineering processes to enhance sustainable development. The study employs a combination of thermodynamic modelling and statistical analysis to optimise the phosphoric acid production process. A novel predictive model is developed using linear regression with robust standard errors ($Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \epsilon$, where Y represents yield, X_1 represents temperature, X_2 represents pressure, ϵ is error). The optimised phosphoric acid production process achieved a 95% yield compared to the baseline. This study demonstrates the feasibility of utilising chemical engineering processes for local phosphate resource utilization in Morocco with significant improvements in efficiency. Further research should be conducted on integrating these processes into existing industrial practices and exploring their scalability across different regions. Phosphate resources, Chemical engineering, Process optimization, Linear regression, Yield improvement

Keywords: Morocco, Phosphate, Chemical Engineering, Process Integration, Waste Management, Sustainable Development, Catalysis

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