

Evaluation of Kirthar Limestone for Manufacturing Calcix Pellets; An Alternative to Traditional Petroleum-Based Plastics

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The evaluation of Kirthar Limestone as a resource for producing Calcix pellets offers a comprehensive examination of its geological properties and chemical composition. The study addresses the pressing issue of plastic pollution, particularly in developing nations like Pakistan, and underscores the necessity of seeking alternatives. It outlines the environmental impact of plastic waste and emphasizes the benefits of Calcix pellets derived from limestone compared to traditional petroleum-based plastics. The manufacturing process of Calcix pellets highlights its simplicity, energy efficiency, and reduced carbon emissions compared to conventional plastic production methods. Cost analysis indicates that Calcix pellet production could be a cost-effective and economically viable alternative to plastic manufacturing. Kirthar Limestone of Eocene age, abundantly available in Pakistan, is deemed suitable for producing Calcix pellets based on geological and chemical analyses. The study examines the presence of various elements such as Al_2O_3 , SiO_2 , CaO , MgO , and Fe_2O_3 and their impact on pelletization. CaO is the main component of limestone which helps in the pelletizing process as a high amount of CaO leads to the polymerization process. All the samples of the study area have a high amount of CaO . Furthermore, MgO content is also desirable for manufacturing limestone pellets as high magnesium contents tend to be sticky. The study also discusses trace element analysis, identifying nickel as a potential concern due to its higher content in some samples.