World Academy of Science, Engineering and Technology
International Journal of Materials and Metallurgical Engineering
Vol:17, No:08, 2023

The Traditional Ceramics Value in the Middle East

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Abstract : Ceramic materials are known for their stability in harsh environments and excellent electrical, mechanical, and thermal properties. They have been widely used in various applications despite the emergence of new materials such as plastics and composites. However, ceramics are often brittle, which can lead to catastrophic failure. The fragility of ceramics and the mechanisms behind their failure have been a topic of extensive research, particularly in load-bearing applications like veneers. Porcelain, a type of traditional pottery, is commonly used in such applications. Traditional pottery consists of clay, silica, and feldspar, and the presence of quartz in the ceramic body can lead to microcracks and stress concentrations. The mullite hypothesis suggests that the strength of porcelain can be improved by increasing the interlocking of mullite needles in the ceramic body. However, there is a lack of reports on Young's moduli in the literature, leading to erroneous conclusions about the mechanical behavior of porcelain. This project aims to investigate the role of quartz and mullite on the mechanical strength of various porcelains while considering factors such as particle size, flexural strength, and fractographic forces. Research Aim: The aim of this research project is to assess the role of quartz and mullite in enhancing the mechanical strength of different porcelains. The project will also explore the effect of reducing particle size on the properties of porcelain, as well as investigate flexural strength and fractographic techniques. Methodology: The methodology for this project involves using scientific expressions and a mix of modern English to ensure the understanding of all attendees. It will include the measurement of Young's modulus and the evaluation of the mechanical behavior of porcelains through various experimental techniques. Findings: The findings of this study will provide a realistic assessment of the role of quartz and mullite in strengthening and reducing the fragility of porcelain. The research will also contribute to a better understanding of the mechanical behavior of ceramics, specifically in load-bearing applications. Theoretical Importance: The theoretical importance of this research lies in its contribution to the understanding of the factors influencing the mechanical strength and fragility of ceramics, particularly porcelain. By investigating the interplay between quartz, mullite, and other variables, this study will enhance our knowledge of the properties and behavior of traditional ceramics. Data Collection and Analysis Procedures: Data for this research will be collected through experiments involving the measurement of Young's modulus and other mechanical properties of porcelains. The effects of quartz, mullite, particle size, flexural strength, and fractographic forces will be examined and analyzed using appropriate statistical techniques and fractographic analysis. Questions Addressed: This research project aims to address the following questions: (1) How does the presence of quartz and mullite affect the mechanical strength of porcelain? (2) What is the impact of reducing particle size on the properties of porcelain? (3) How do flexural strength and fractographic forces influence the behavior of porcelains? Conclusion: In conclusion, this research project aims to enhance the understanding of the role of quartz and mullite in strengthening and reducing the fragility of porcelain. By investigating the mechanical properties of porcelains and considering factors such as particle size, flexural strength, and fractographic forces, this study will contribute to the knowledge of traditional ceramics and their potential applications. The findings will have practical implications for the use of ceramics in various fields.

Keywords : stability, harsh environments, electrical, techniques, mechanical disadvantages, materials
Conference Title : ICCMMS 2023 : International Conference on Ceramic Materials, Mechanics and Structures
Conference Location : Barcelona, Spain
Conference Dates : August 10-11, 2023