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# A new and economic approach to synthesize and fabricate anorthite based ceramics using kaolin and $\text{CaCO}_3$

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**Abstract :** This new and economic approach to fabricate resistant anorthite based ceramics consists of Algerian kaolin and calcite ( $\text{CaCO}_3$ ). The anorthite ( $\text{CaO} \cdot \text{Al}_2\text{O}_3 \cdot 2\text{SiO}_2$ ) based ceramics were obtained by solid state reaction. The starting powders were sintered at different temperatures (800-1100°C) for 1 h. The optimum sintering conditions gave a relatively higher density (2.64 g/cm<sup>3</sup>). Different techniques were used to investigate the physical properties of the prepared anorthite such as: scanning electron microscopy, X-ray diffraction, Raman spectroscopy and tensile strength. The best obtained 3 points flexural strength value was about 202 MPa for the samples sintered at 1000 °C for 1 h. Furthermore, the best value of Vickers micro-hardness of the samples sintered at 1000 °C was 7.1 GPa. Finally, a correlation between microstructure and mechanical properties of elaborated supports has been discussed.

**Keywords :** anorthite, Kaolin, calcite, Sintering, Vickers micro-hardness, tensile strength.