

Application of Rheology in the Enhancement of Mechanical and Thermal Properties of red Clay Bricks.

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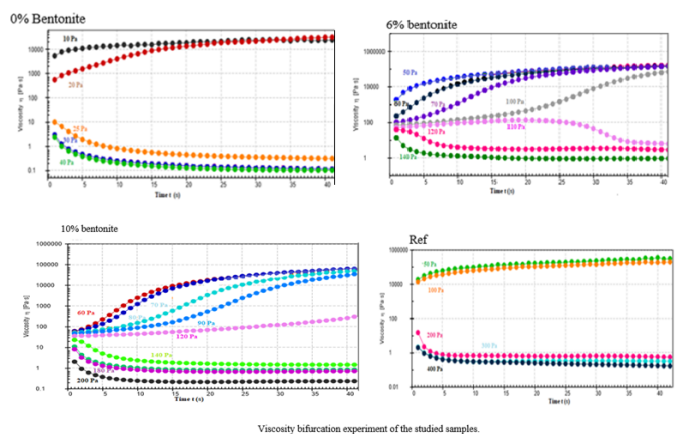
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Abstract

The exploitation of locally available materials can be a viable alternative for sustainable development. To minimize the economic and environmental impact of transporting clay materials, clayey materials from nearby deposits should be used in the building-related ceramic industry. This study aims to develop an innovative scientific methodology for adjusting the physicochemical composition of any clay soil to make it appropriate for construction applications. This research was carried out on unexploited clayey soil extracted from Bensmim village (Morocco). The "Extrabrick" brick manufactory clay sample was used as. Grain size analysis and Atterbergs limits showed that Extrabrick sample is characterized by high plasticity related to the presence of smectite clay. Based on the conducted tests, Bensmim clay was confirmed to be an unsuitable raw material for clay bricks production. Therefore, improving the plasticity of Bensmim clay was taken as a critical factor to enhance the properties of this clay. Different percentages of bentonite, ranging from 0-10%, were added to study the effect of this addition on the rheological and mechanical tests. The addition of 10% bentonite showed an increase in the yield stress, viscosity, and the mixture exhibited a rheological behavior like the reference sample. And a value of compressive strength of 8.2 MPa very close very close to the value found for the reference sample value of 8.8 MPa.

Figure



Recent Publications

1. El Boukili G., Khaldoun A. *Journal of Building Engineering* Volume 63, Part B, 1 (2023), 105525
2. Boukili, G. Lechheb M., M. Ouakarrouch, Dekayir, F. Kifani-Sahban, and A. Khaldoun, *Constr. Build. Mater.*, vol. 280, p. 122300, Apr. 2021, doi: 10.1016/j.conbuildmat.2021.122300.
3. Khaldoun A. Wegdam G., Bonn D., *Phys. Rev. Lett.*, vol. 103, no. 18, p. 188301, 2009.
4. Khaldoun A. Wegdam G., Bonn D., *Nature* (2005) 437(7059):635

Biography



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Asmae Khaldoun has a Physics BSc and M. Sc. degree in Renewable Energy from the University Mohamed V in Rabat. She earned her Ph.D. in physical chemistry at the University of Abdel Malek Essaadi in Morocco in 2002. She got a second Ph.D. in Physics "Soft condensed Matter" on January 10th, 2013 at the University of Amsterdam. From 2004 to 2007 she worked, as Post Doc at the University of Amsterdam, under the direction of Profs. Daniel Bonn. This group – and particularly its work on complex fluids – is acknowledged to be among the premier experimental chemical engineering research programs worldwide. In September 2009, she started working at Al Akhawayn University as Assistant Professor and got promoted to Associate Professor in 2016. She published more than 80 papers. Her H-index is 16 on Scopus.

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