World Academy of Science, Engineering and Technology
International Journal of Materials and Metallurgical Engineering
Vol:11, No:05, 2017

The Influence of Water and Salt Crystals Content on Thermal Conductivity Coefficient of Red Clay Brick

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Abstract : This paper presents results of experiments aimed at studying hygro-thermal properties of red clay brick. The main objective of research was to investigate the relation between thermal conductivity coefficient of brick and its water or Na2SO4 solution content. The research was conducted using stationary technique for the totally dried specimens, as well as the ones 25%, 50%, 75% and 100% imbued with water or sodium sulfate solution. Additionally, a sorption isotherm test was conducted for seven relative humidity levels. Furthermore the change of red clay brick pore structure before and after imbuing with water and salt solution was investigated by multi-cycle mercury intrusion test. The experimental results confirm negative influence of water or sodium sulphate on thermal properties of material. The value of thermal conductivity coefficient increases along with growth of water or Na_2SO_4 solution content. The study shows that the presence of Na_2SO_4 solution has less negative influence on brick's thermal conductivity coefficient than water.

Keywords : building materials, red clay brick, sodium sulfate, thermal conductivity coefficient
Conference Title : ICBMC 2017 : International Conference on Building Materials and Components
Conference Location : Paris, France
Conference Dates : May 18-19, 2017