

## A study of compressive strength of the geopolymers pastes additivated with non-ionic latex

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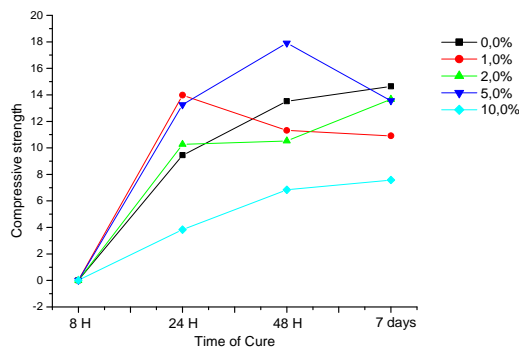
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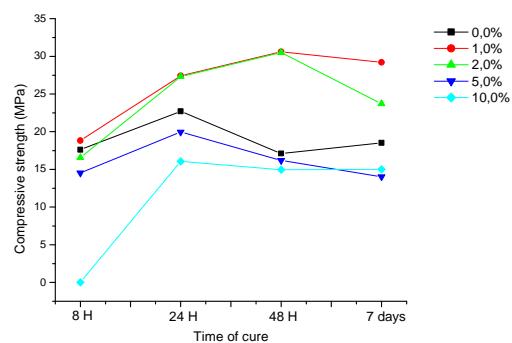
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**Abstract** – Cement pastes, which are used in each section of a oilwell, are prepared according to several operational factors and locations. A strong cement with low permeability is normally required in oilwell operations. The addition of non-ionic latex in geopolymers pastes increase its thermomechanical properties. The objective of this work was to study and characterize the mechanical properties of the geopolymers pastes additivated with non-ionic latex. In this study was concluded that the addition of non-ionic latex increased the compressive strength of the geopolymers pastes.

The development of activities in the oil and gas sector has been promoting the search for materials more adequate to oilwell cementing operation [1]. In the state of Rio Grande do Norte, the cement sheath integrity tend to fail during steam injection operation which is necessary to increase oil recovery in reservoir with heavy oil. Geopolymer is a material that can be used as an alternative cement. It has been used in manufacturing of fireproof compounds, construction of structures and for controlling of toxic or radioactive waste [2]. Latex is widely used in Portland cement pastes and its characteristic is the increase of mechanical properties. Then, the purpose of this work was to study and characterize the compressive strength of the geopolymers pastes constituted of metakaolinite, potassium silicate, potassium hydroxide and non-ionic latex cured at the ambient temperature (26,7 °C) and heated to 60 °C. The tests were carried out in accordance to the practical recommendations of the norm API RP 10B. The pastes were blended, thereafter poured in 3 plastic molds and then cured in air. The tests of compressive strength were carried out after 8 h, 24 h, 48 h and 7 days of cure. The pastes cured at the ambient temperature increased their compressive strength with the increase of the curing time. The pastes cured at 60 °C did not increase their compressive strength with the increase of curing time, even so the pastes cured at 60 °C did not decrease their compressive strength in relation to the pastes without additive. From the results, it was concluded that the latex non-ionic improve the mechanical properties of the geopolymers pastes.



**Figure 1:** Compressive strength versus non-ionic latex concentration, at the ambient temperature (26,7°C), curing time at 8 h, 24 h, 48 h e 7 days



**Figure 2:** Compressive strength versus non-ionic latex concentration, at the heated temperature (52°C), curing time at 8 h, 24 h, 48 h e 7 days

### References

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