Comparison between OPC mortars and biomass mortar.

Fig. 6 represents the comparison between OPC, high volume POFA mortar and palm oil biomass waste mortar. It can be seen from the figure that at early age OPC mortar shows higher strength than others. However, the high volume POFA mortar and biomass mortar show higher compressive strength at 28 days which is 34 and 36 MPa, respectively. This is due to the pozzolanic reaction derived from POFA with the calcium hydroxide to produce more calcium silicate hydrate gel and make the mortar denser similar to the finding from other researcher [25].

Conclusion

The conclusions that can be drawn from this study is that high volume POFA with some modification can be used up to 80% as cement replacement and achieve higher strength than OPC mortar at later age. The fineness of POFA which is less than 2 µm gives better effect to the mortar both as binder and filler. The use of OPKS as sand replacement can reduce the density of mortar with comparable strength of the OPC mortar. More than 80% waste from palm oil biomass can be used to produce mortar with better strength than normal mortar.