

FEASIBILITY OF FERROSILICON SLAG AS PRECURSOR OF ALKALI-ACTIVATED MATERIALS OR GEOPOLYMERS

P. Delgado-Plana^{1*}, J. de la Torre Bayo¹, J.S. Bueno¹, L. Pérez-Villarejo^{2,3}, D. Eliche Quesada^{1,3}

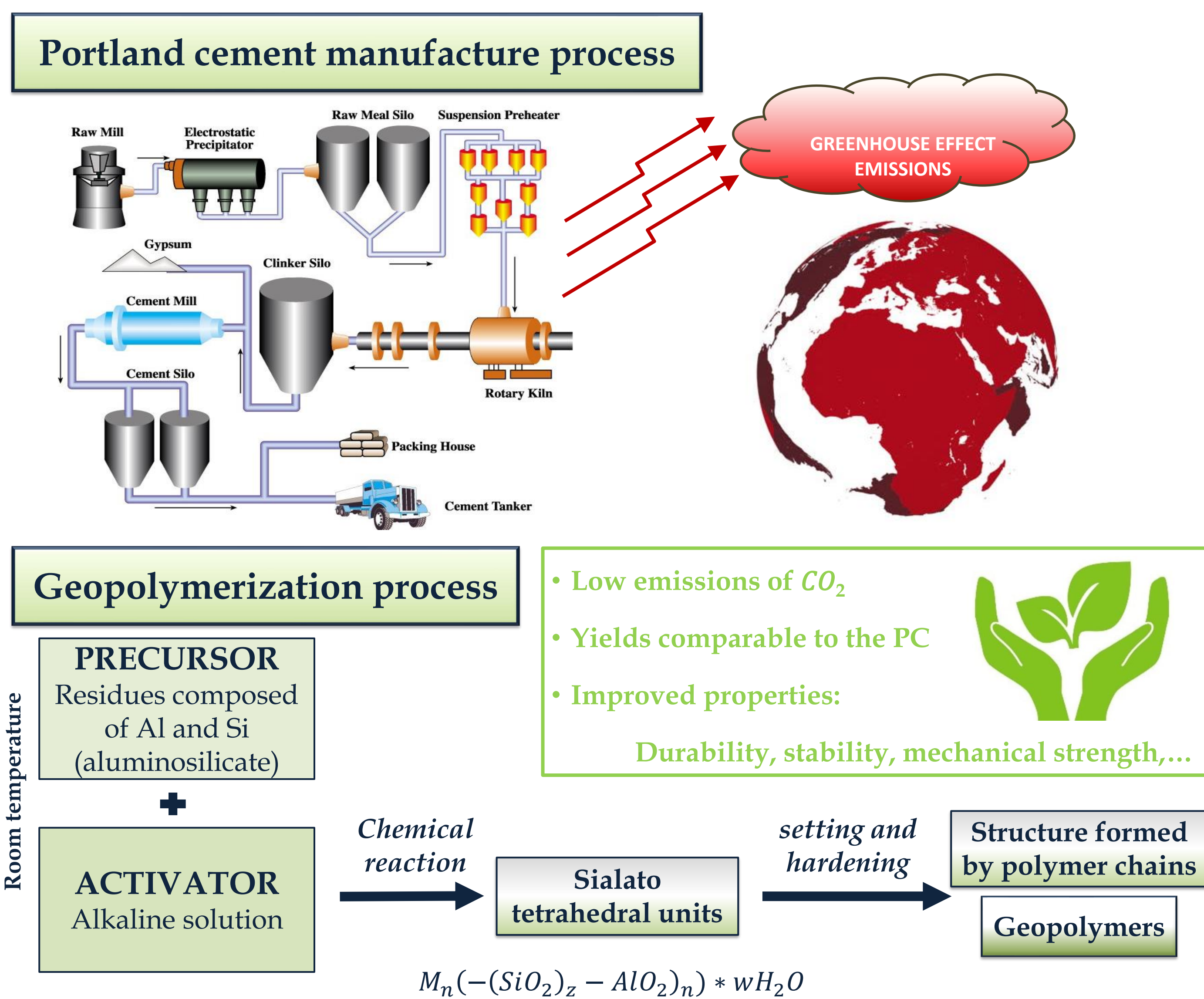
¹Department of Chemical, Environmental, and Materials Engineering, Higher Polytechnic School of Jaén, University of Jaen, Campus Las Lagunillas s/n, 23071 Jaén, Spain

²Department of Chemical, Environmental, and Materials Engineering, Higher Polytechnic School of Linares, University of Jaen, Campus Científico-Tecnológico, Cinturón Sur s/n, 23700 Linares (Jaén), Spain

³Center for Advanced Studies in Earth Sciences, Energy and Environment (CEACTEMA), University of Jaén, Campus Las Lagunillas, s/n, 23071 Jaén, Spain

*pdplana@ujaen.es

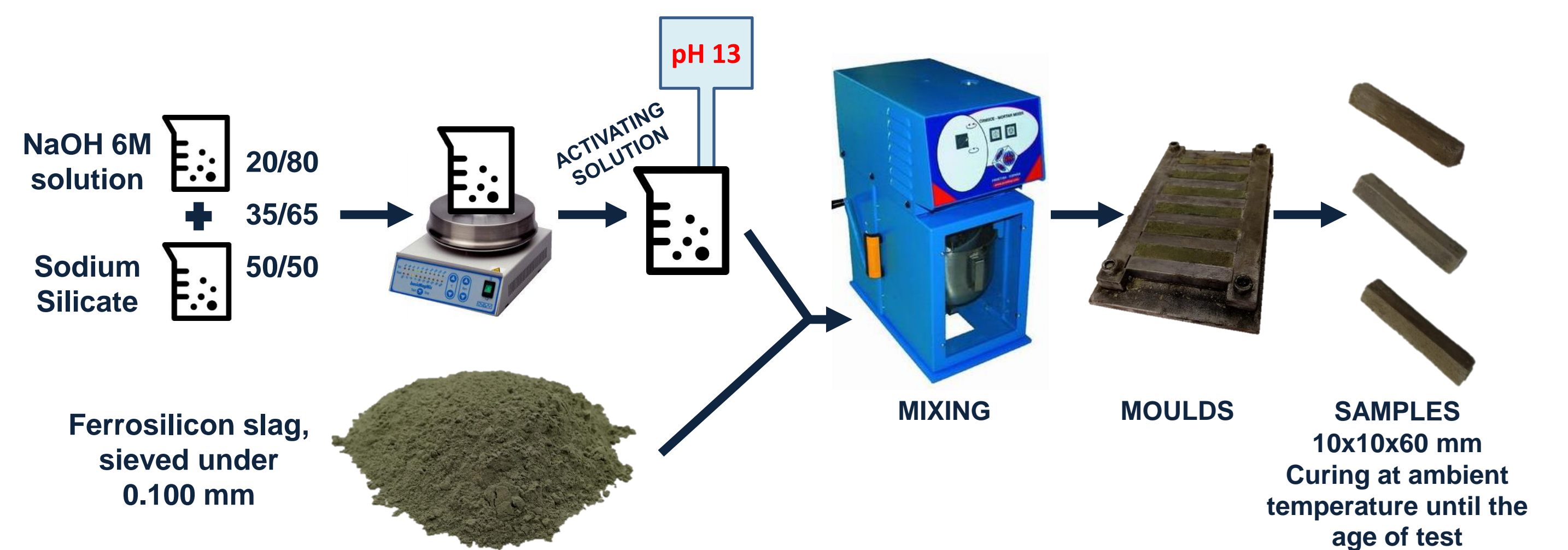
INTRODUCTION



OBJECTIVES

This study aims at analysing the feasibility of using ferrosilicon slag as precursor for alkali-activated green cements under different activation conditions.

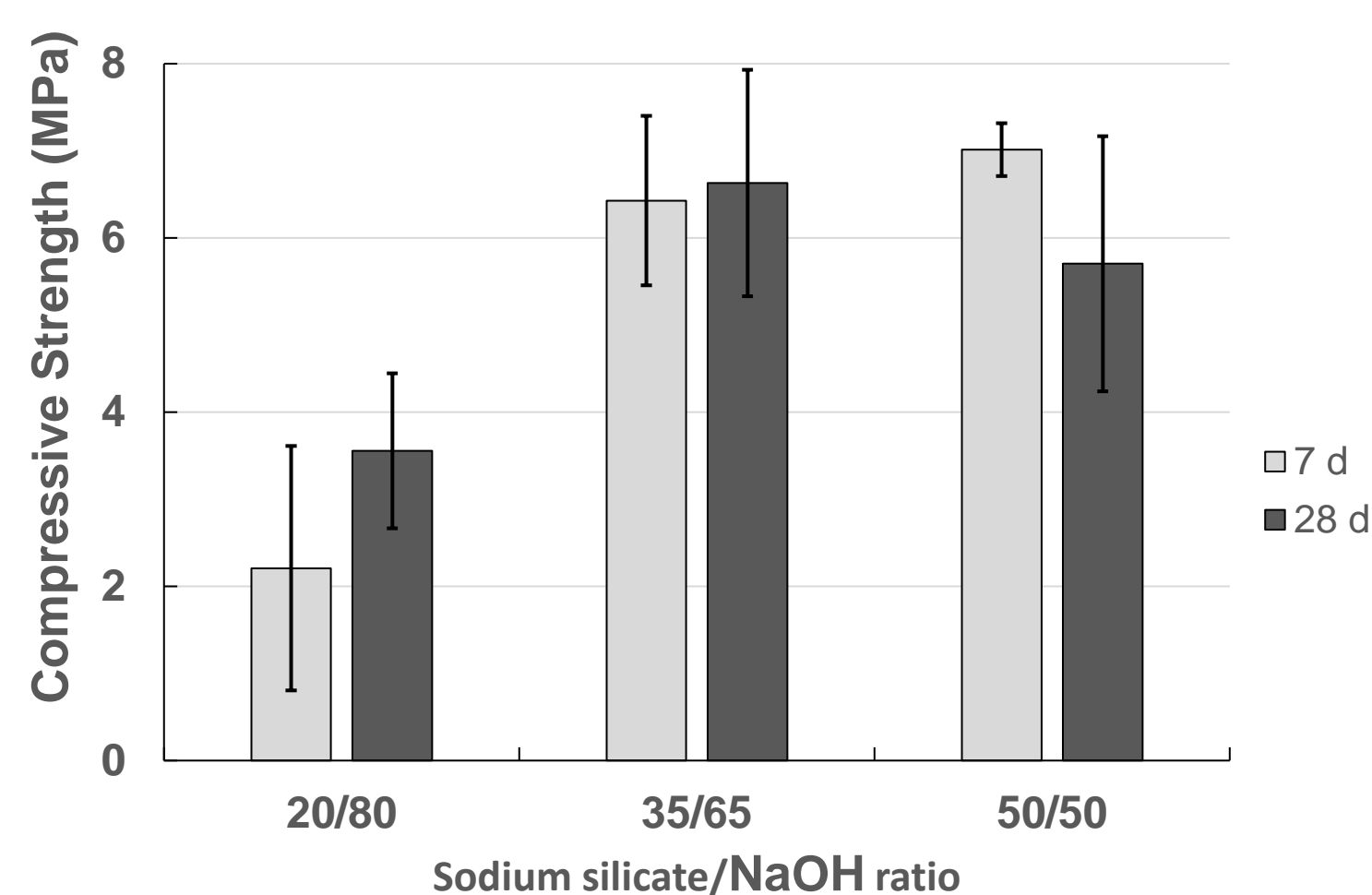
SYNTHESIS OF GEOPOLYMERS



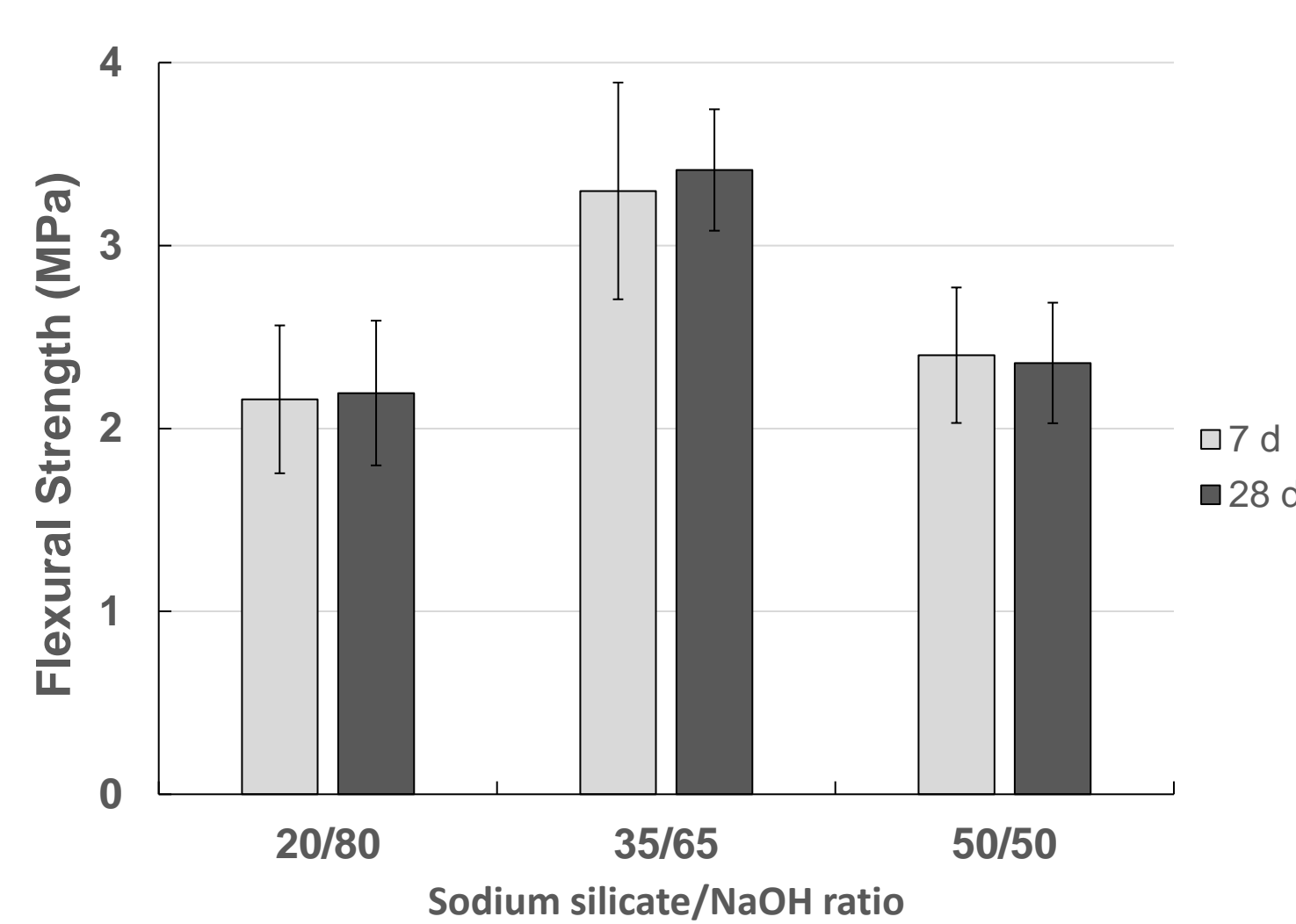
Alkaline solutions were prepared by mixing sodium silicate solution (29.2 wt % of SiO₂, 8.9 wt % of Na₂O and 61.9 wt % of H₂O) and NaOH solution (6 M) in different weight ratios (20/80, 35/65 and 50/50). The fraction alkaline solution - solid material was fixed at 0.4 in all cases.

RESULTS AND DISCUSSION

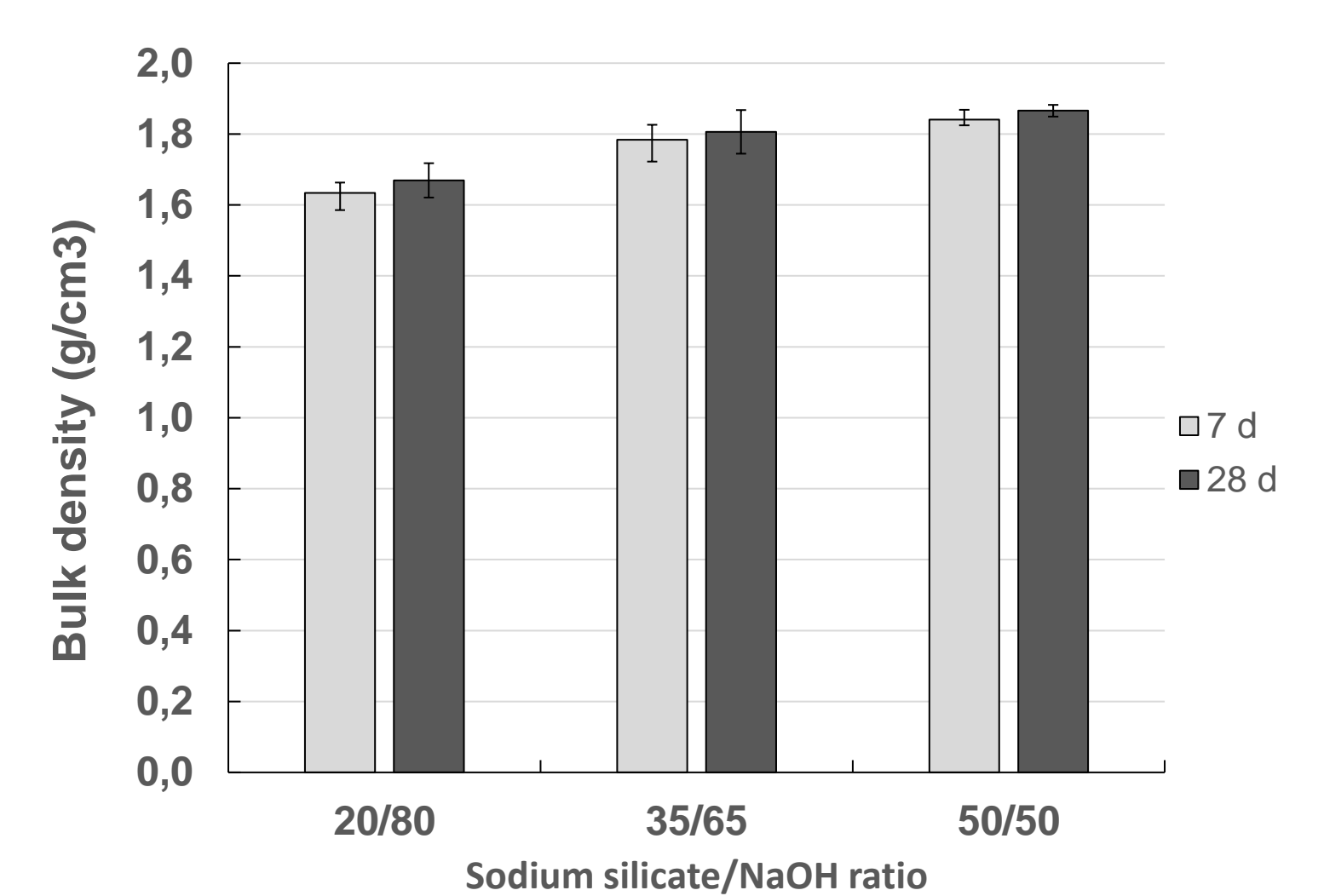
COMPRESSIVE STRENGTH



FLEXURAL STRENGTH



BULK DENSITY



Sodium silicate/NaOH ratio of 65/35 seems to be optimum for the mechanical properties. Compressive strength results which vary from 3.6 to 6.6 MPa at 28 days of curing. On the whole, density and compressive and flexural strength improve with the time of curing.

CONCLUSIONS

In view of the results of the tests performed, the ratio silicate/NaOH appears to have a significant influence on the synthesis of these alkaline-activated materials. Higher ratios of SS/NaOH lead to better compressive strength results which vary from 3.6 to 6.6 MPa at 28 days of curing.

Taking into account the results of this study, ferrosilicon slag seems to be a proper raw material in the manufacturing of geopolymers for construction which constitutes potential environmental benefits in terms of energy saving and reduction of pollutant emission.

ACKNOWLEDGMENTS

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