TÉCNICO LISBOA

IMPROVING CEMENT WASTE RECYCLING BY CARBONATION
THE FEASIBILITY OF A SHORT CARBONATION PROCESS

André Silva, Rita Nogueira (speaker), J. Alexandre Bogas, M.F. Costa Pereira

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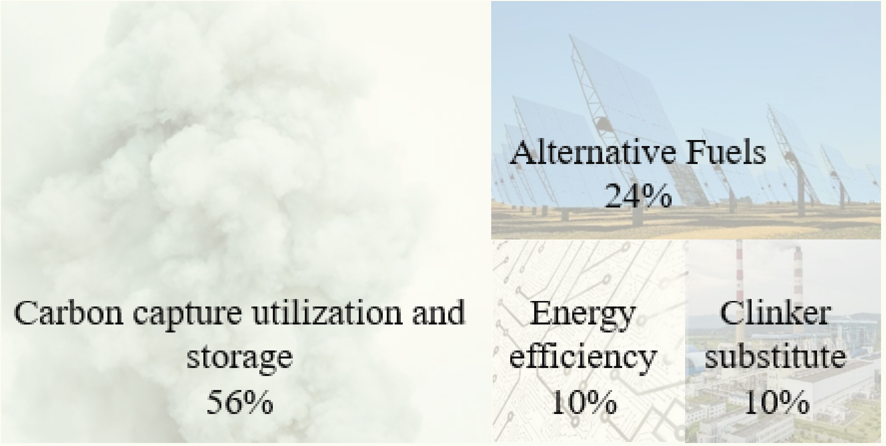
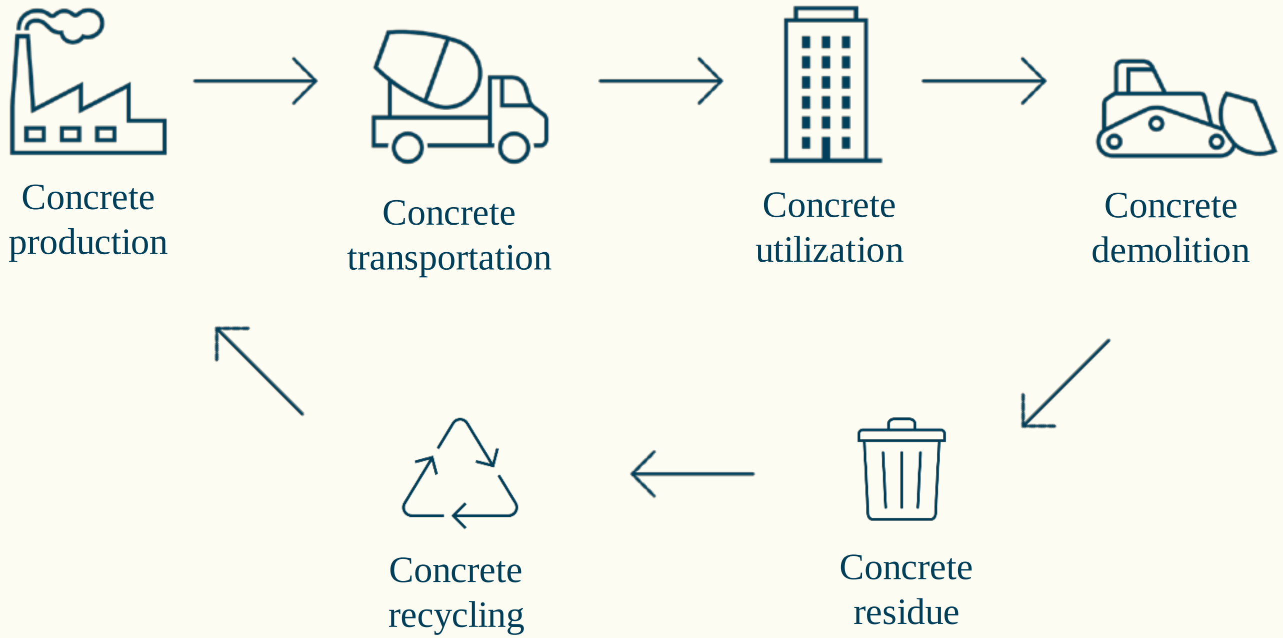
Introduction





INTRODUCTION

1. Introduction

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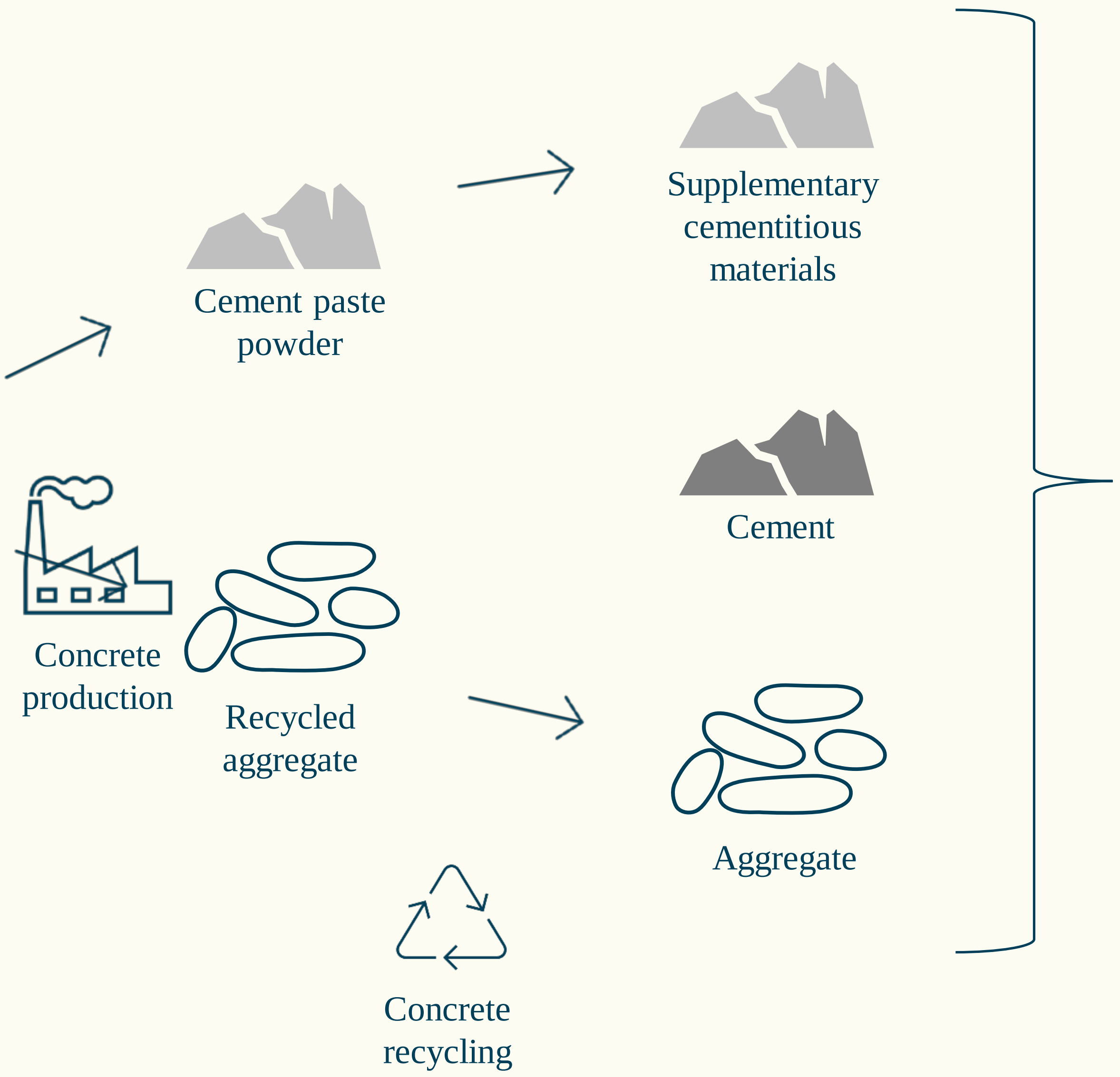
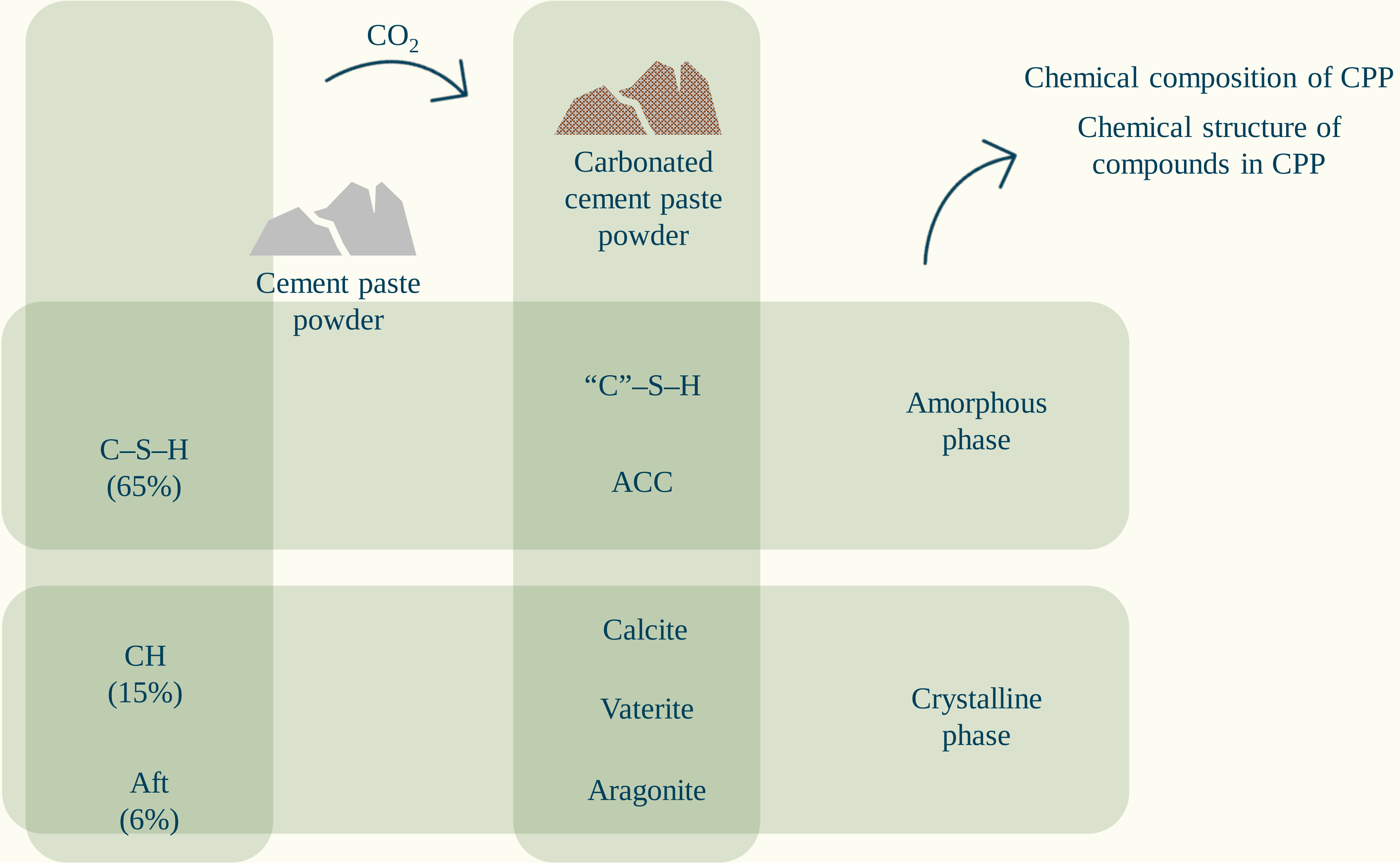
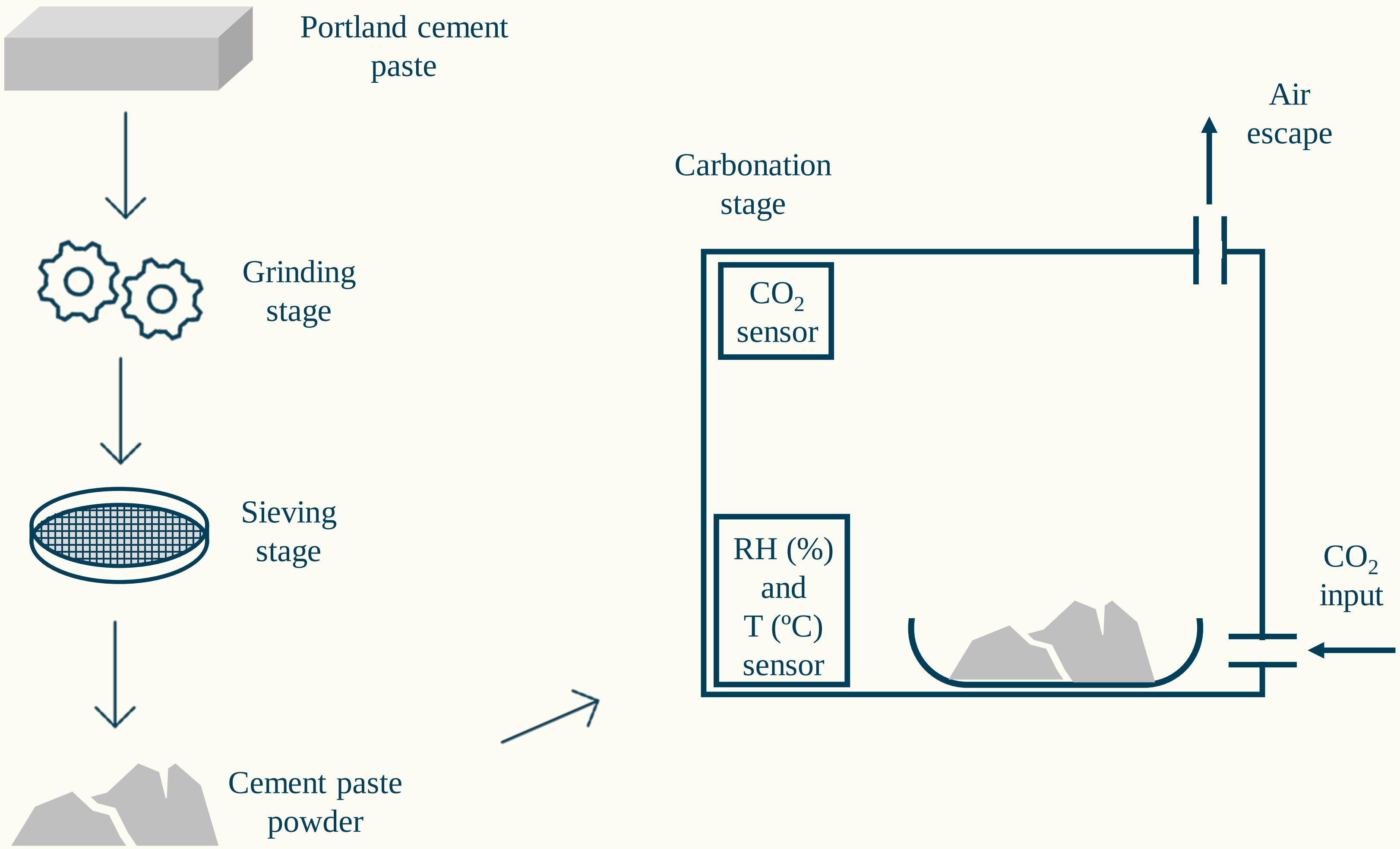


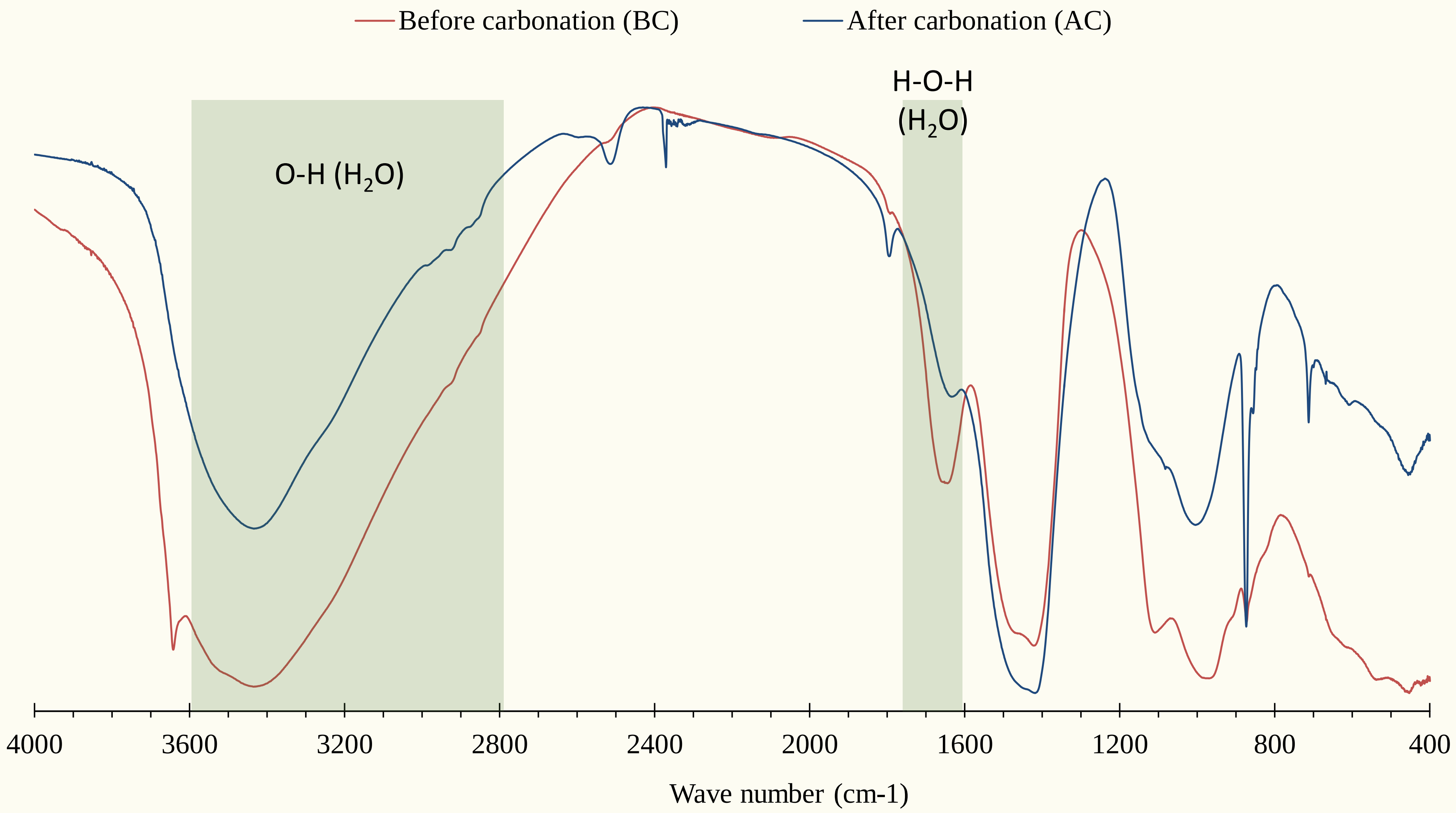
INTRODUCTION



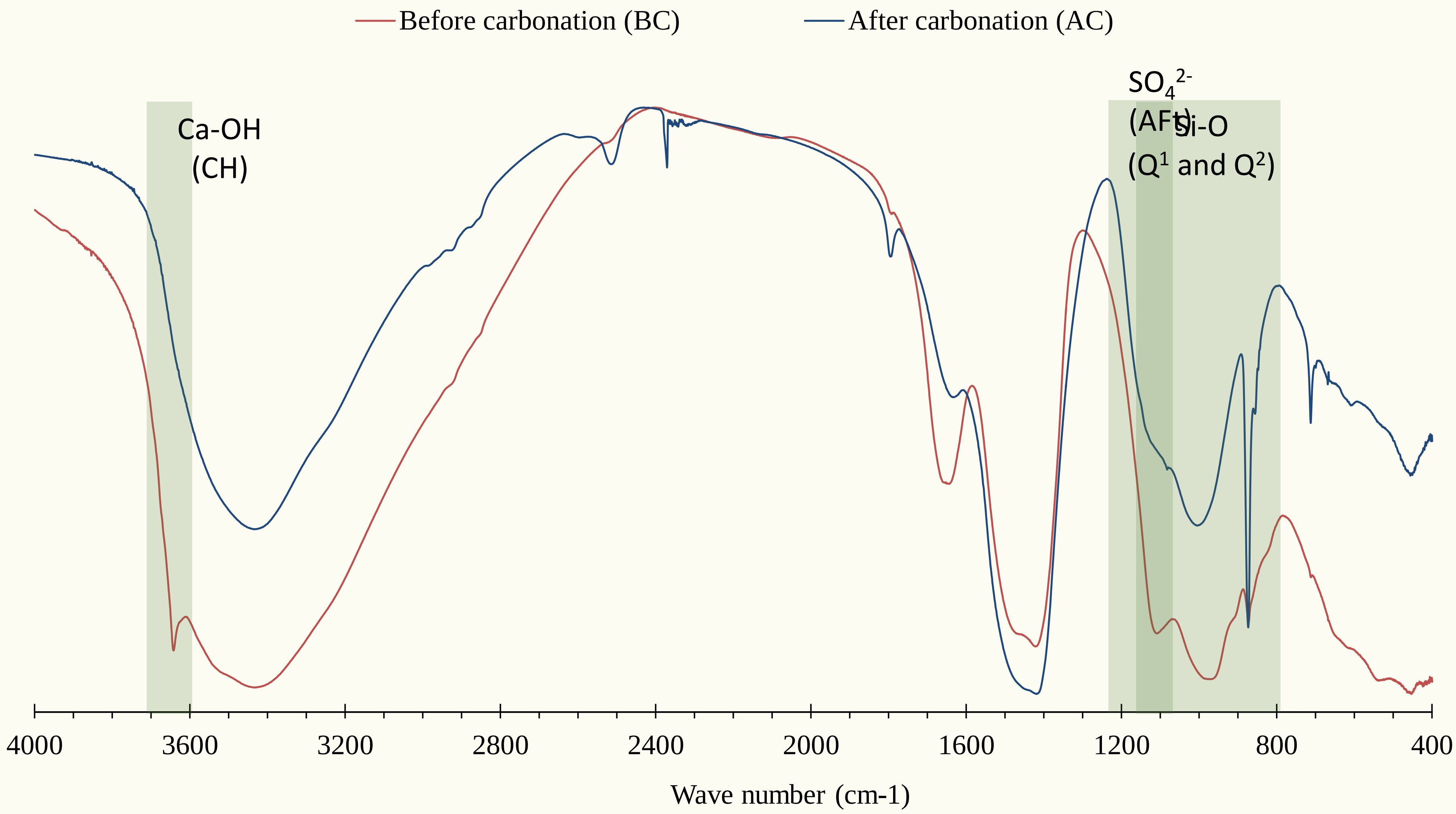
Materials and Methods



FTIR Results



FTIR RESULTS



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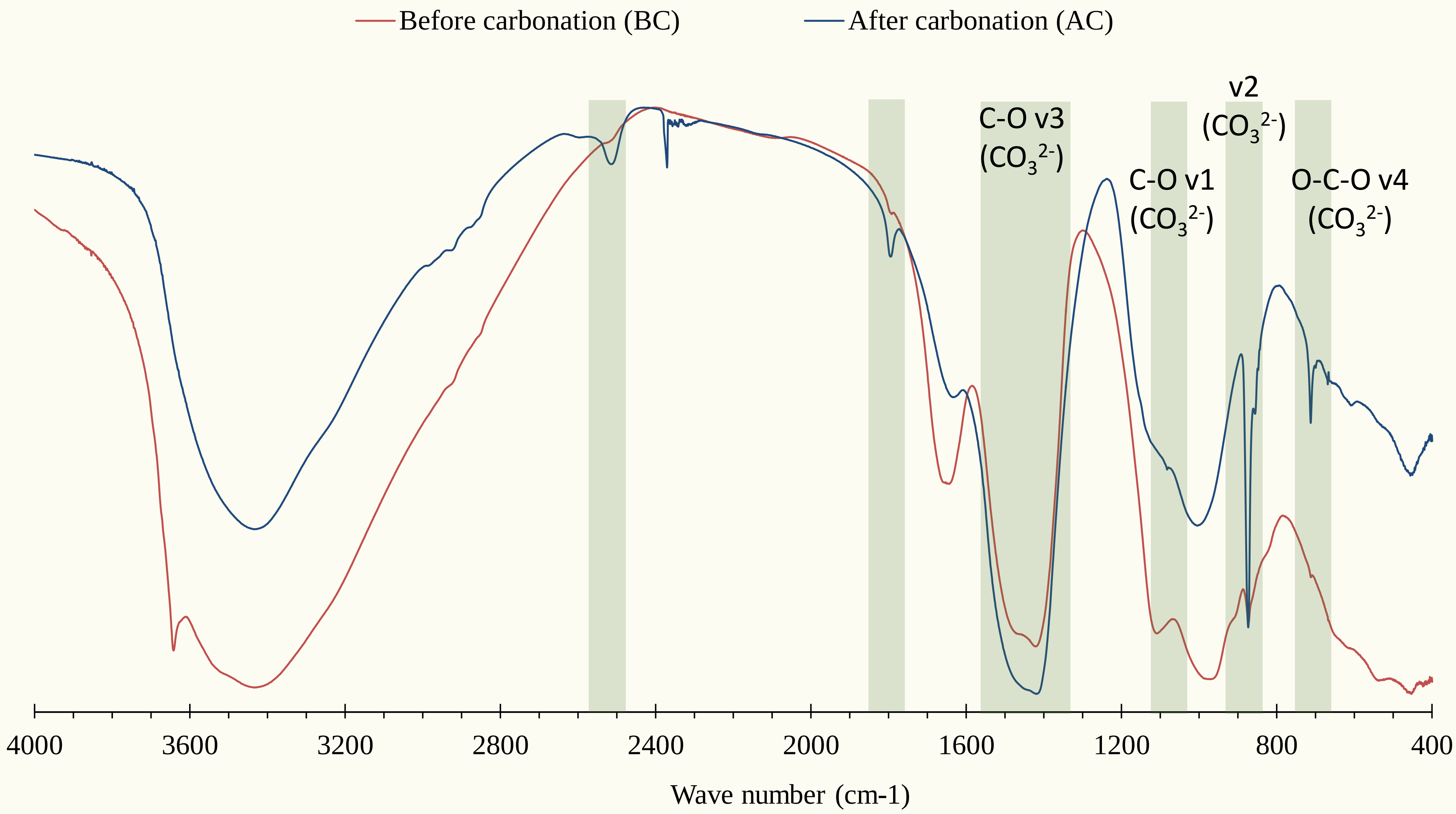
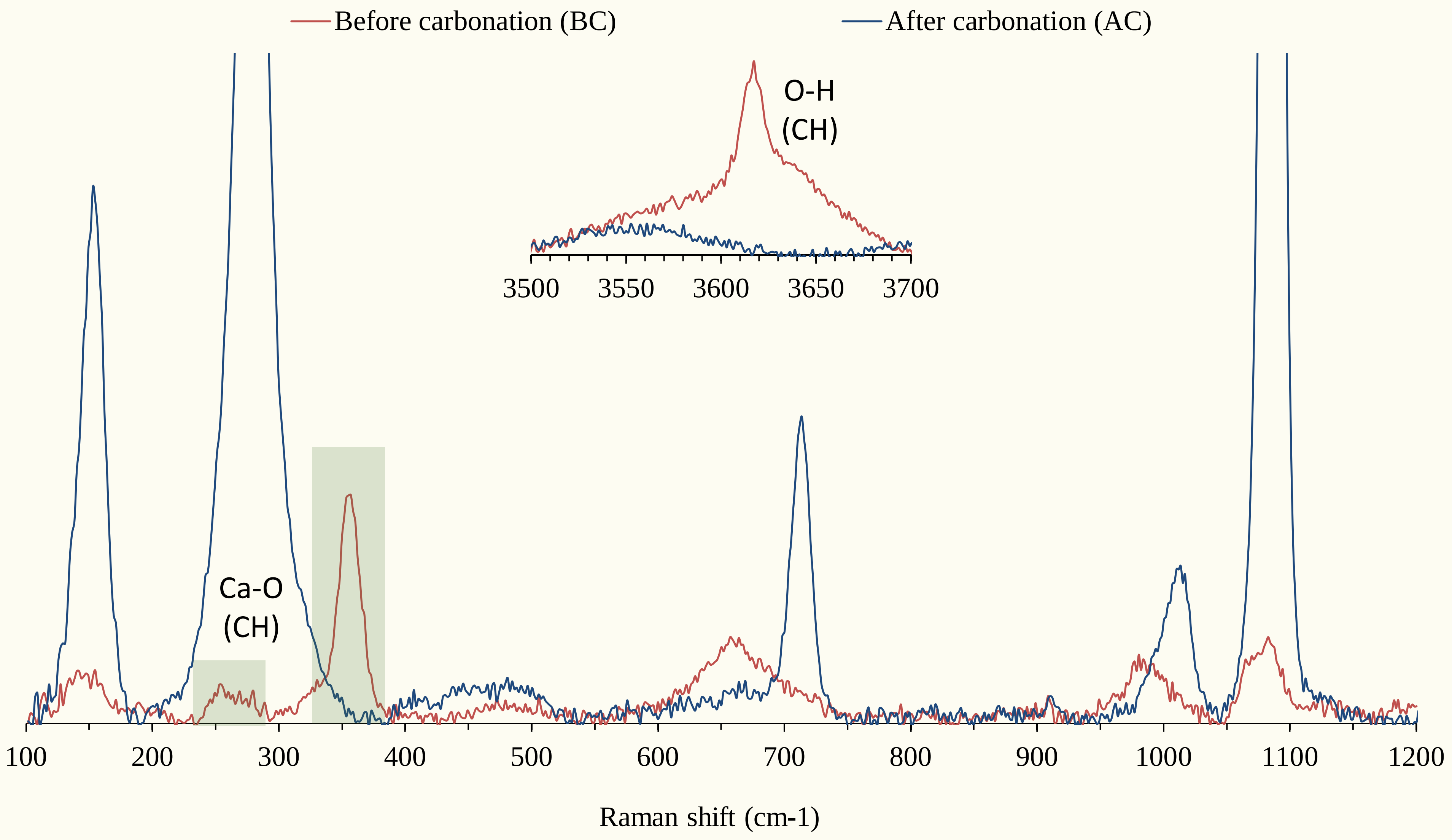
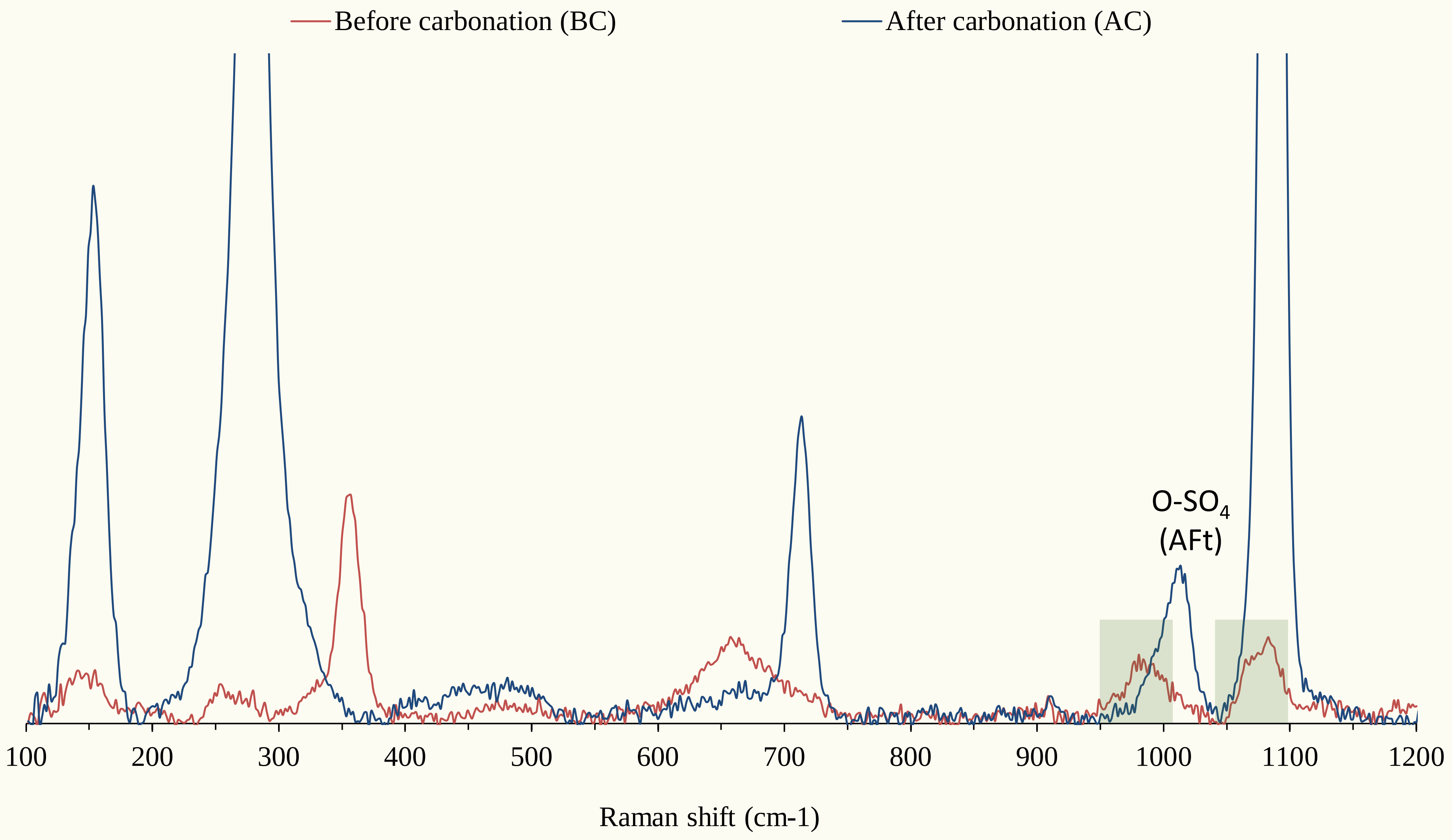


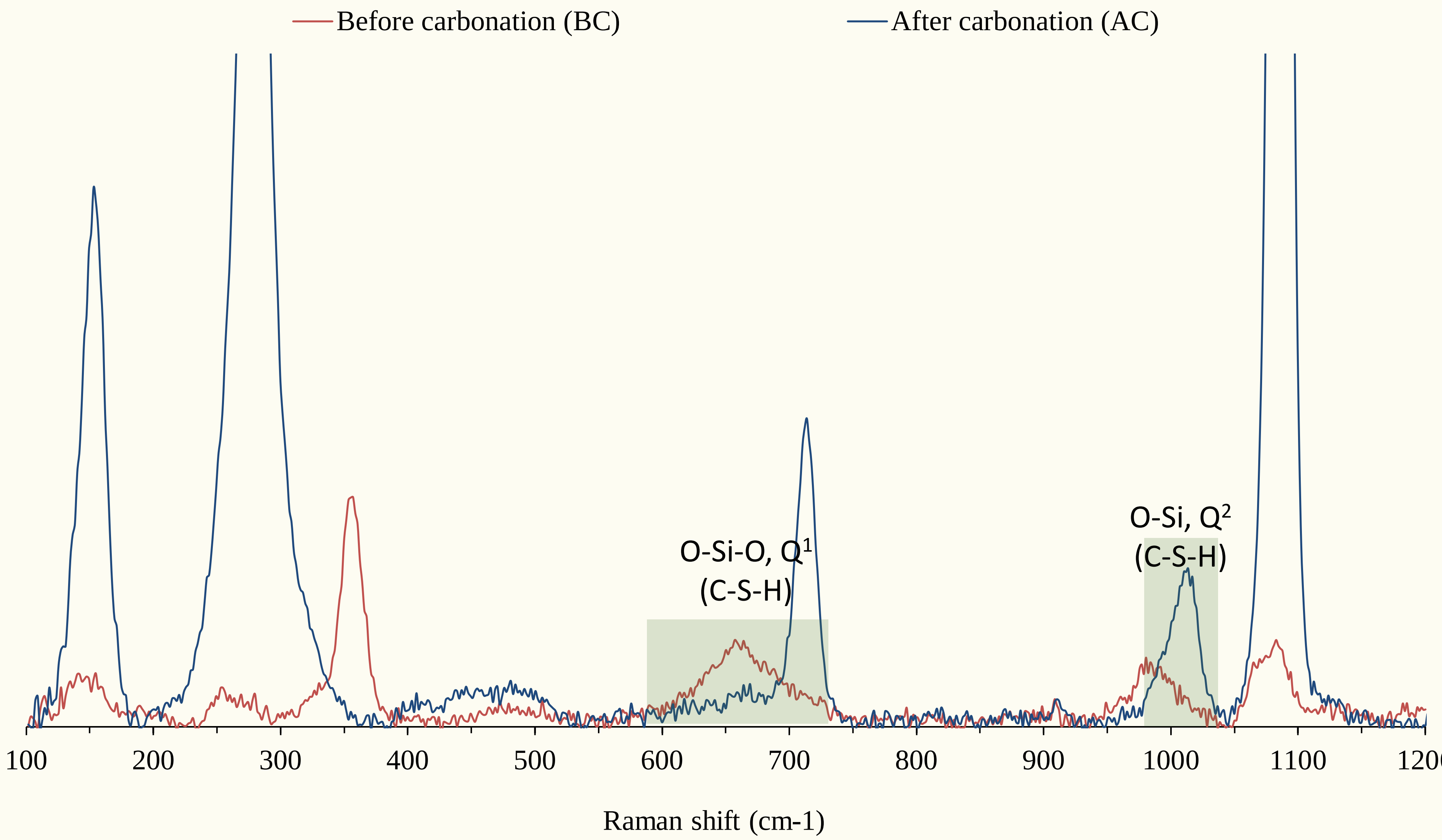
RAMAN RESULTS



RAMAN RESULTS



RAMAN RESULTS



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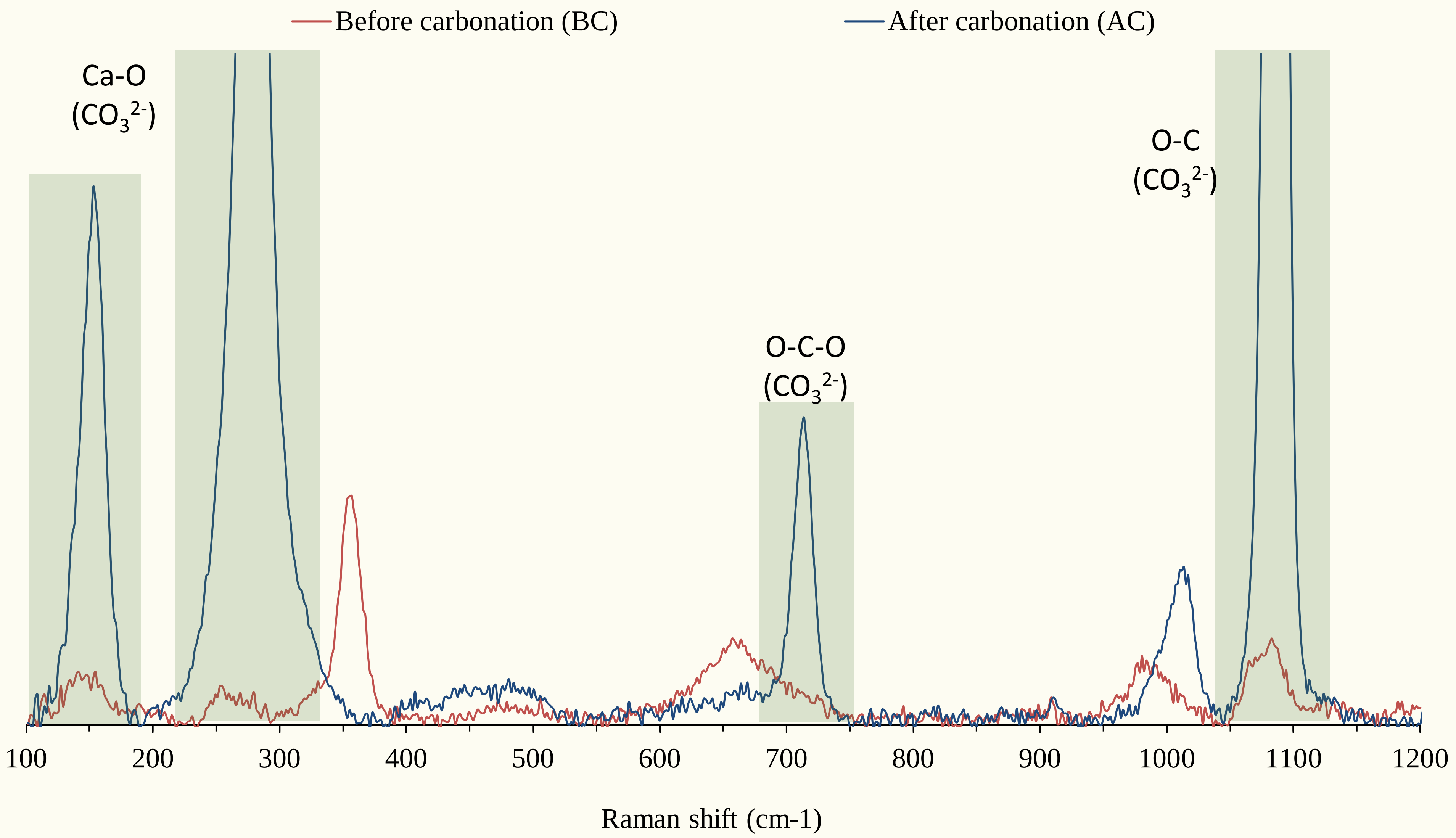

CONCLUSIONS

- Both CH and AFt were carbonated
- C-S-H reacted with CO_2 during the carbonation process, originating a polymerization reaction, associated with the decalcification of the Ca-O layer of C-S-H. The duration of this carbonation process was not enough to obtain silica-gel, since Q^3 and Q^4 species were not identified.
- The main CC polymorph present in CPP after the carbonation process was calcite. FTIR point out ACC as the second most probable polymorph. The presence of simultaneous CC polymorphs in CPP is very probable, but could not be fully demonstrated.

CONCLUSIONS

- The spectroscopy techniques were able to independently characterize both the composition and chemical structure of CPP before and after the carbonation process
- The utilization of both techniques enabled a redundant analysis, thus increasing the certainty of the results obtained
- Despite not enabling a quantitative analysis, their expeditious and simplicity emphasises its relevance

Acknowledgements

This work was supported by the Polish National Agency for Academic Exchange under Grant No. PPI/APM/2019/1/00042/U/00001, by the CERIS Research Centre, Instituto Superior Técnico, Universidade de Lisboa and by FCT through scholarship SFRH/BD/147856/2019. The authors would also like to acknowledge Professor Luís Santos for the experimental support with Raman Spectroscopy analysis.

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THANK YOU FOR YOUR ATTENTION

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