

ligne4 du résumé : non hydratés  
remplacer effectué par obtenu  
remplacer réaliés par issus d'essais...  
le français devra être nettement amélioré dans le résumé.

**: Le texte en français a été amélioré pour mieux expliquer les travaux réalisés.**

C1 and C2 of Hyvert's model also consider different calcium based forms contrarely to what it is written.

**: The additional information about Hyvert's model has been added.**

integrals are not suitable in eq 1a to 1e, otherwise explain what id omega cp(t)

**: omega cp has been explained " where .. represents the cement paste medium only due to the fact that sand aggregate does not react with CO2 gas"**

the role of sand grains is not obvious in section 3

**: The additional text has been added to explain better the issue '**

**The use of randomly distributed spherical grains through the cement paste can include the effect of corners, curvature, even surface roughness whose existence would affect the CO2 diffusion across porous cement paste materials in an implicit manner.**

fig 2 and 6 are quasi the same, not necessary to have the both

**: Two figures are not same at all. One can easily distinguish the tortuosity effect on the CO2 diffusion according to the low (fig2) and high (fig6) CO2 concentration.**

biblio 17 to 25 and associated conclusion not pertinent for a paper dedicated to carbonation.

**: The present paper aims to show that the numerical modeling based on the mass transport phenomenon is not able to determine the carbonation phenomenon (particularly high concentration case). One of main reason is that the porous medium involving highly complex pore network would lead to the relatively random crystallization. Consequently, there are some porous network modifications (size, shape and distribution of pores) whose effects would be considered using the deformable porous media at pore-scale, e.g. micro-dilatation theory. That is why the micro-dilatation theory has been addressed as an interesting alternative method (Jena Jeong, Hamidréza Ramézani, and Nordine Leklou. Porous-micro-dilatation theory for random crystallization : Monte carlo simulation for delayed ettringite formation. Acta Mechanica, pages 1-27, June 2017).**