Response to the comments

Thank you for the valuable comments and suggestions. We have modified the manuscript accordingly. The corrections are marked in red in the paper. The responds to the comments are listed below point by point.

2.1 Fabrication of the film
Comment 1
HT is prepared using the same procedure in the reference (Corrosion Science 53 (2011) 3281–3288). Authors need to add the paragraph tells the reader that they have followed the same procedure in the Corrosion Science 53 (2011) 3281–3288 for film fabrication.
✓ This paragraph has been added. See details in the section 2.1 in red font.

Comment 2
The method of the film preparation needs to be re-written to be clear for the reader. For example how much the amount of Al is added to make the solution saturated? Regarding the addition of Al panel, it seems that Al dissolved in acidic solution followed by addition of Na₂CO₃. The sequence needs to be clear for the reader.
✓ The experimental procedure has been described more clearly and exactly. See details in the section 2.1 in red font. Whereas, the content of Al has not been measured, but which is sufficient to synthesise the Mg-Al HT according to our precious research (J. Chen, Y.W. Song, D.Y. Shan, E.H. Han, Study of the in situ growth mechanism of Mg-Al hydrotalcite conversion film on AZ31 magnesium alloy, Corrosion Science, 2012, 63: 148-158).

Comment 3
Give some information on the AZ31 coupons; i.e., cast? extruded? grain size?
✓ The information of the AZ31 coupons has been added. See details in the section 2.1 in red font.

2.2 Characterization
Comment 4
How many times the electrochemical tests were carried out for reproducibility?
✓ The electrochemical tests were done at least three times to ensure the correction and repeatability of the data. Only one curve was shown, the date value of which is in the middle.

3. Results
Comment 5
The delay time of 300 s prior to polarization test is very short. Why the authors choose this short duration of immersion in Hanks’ solution prior to the electrochemical test? The coated and uncoated AZ31 need immersion time longer than
5 min (300 s) to reach the stabilization (where the fluctuation of OCP reaches 10mV per 1000s) prior to the polarization test.

- Yes. The delay time of 300 s prior to polarization test is short. However, you know that a corrosion products film was formed continuously on the surface according to the morphology observation. We worried about that the testing result might not be related to the fresh surface of the samples when the immersion time was prolonged. Thank you for the review’s suggestion. In future research, we will extend the immersion time longer than 5 min in Hanks’ solution prior to the polarization test.

Comment 6
Hydrogen gas generation by rapid corrosion is one of an important issue for Mg alloy as bioimplants. The authors need to comment on whether the coating will simply delay the start of corrosion, or slow down the corrosion speed, and reduce the influence of hydrogen gas?

- We have mentioned that the coating delayed the start of corrosion and slow down the corrosion speed. See details in the sections of “Electrochemical corrosion test” and “Summary”.
- Yes. The hydrogen gas generation rate is very important. The measurement of hydrogen evolution will carried out in the future study.

3.5. Composition analysis of the film
Comment 7
The Authors mentioned that the EDS result shows that the chemical composition of the original HT film only contains C, Mg, Al and O, however, Table 1 shows only Mg, Al and O, please add the C content to the table for region 1 and 2.

- We have added the C content to Table 1 for region 1 and 2.

4. Discussion
Comment 8
The examination time of 3 days is very short considering clinical applications. The authors need to discuss/comment long term consequence, prediction of the corrosion resistance for a necessary duration.

- Yes, the examination time of 3 days is short for clinical applications. However, this examination time is for the electrochemical test. When in the immersion test, the examination time was 15 days. And after 15 days immersion, the majority of the coated sample is not attacked. In future research, long term examination will be carried out, especially in the in-vivo test. Thanks very much for the reviewer’s suggestion.