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.

1) Abstract should be revised. The first sentence shall be removed and the second sentence should be corrected accordingly.
   ✓ We have revised these sentences. See details in the abstract in red font.

2) Please avoid phrases like “The results show”.
   ✓ These phrases have been removed.

3) Line 17: should read “the HT film provides an …”. Please also avoid using subjective phrases like “excellent” and use more qualitative expressions.
   ✓ This word has been revised. See details in the line 17 in red font.

4) Line 37 “Mg based implants do not need the second surgery” should be revised.
   ✓ We have revised this sentence.

5) Line 42: “problems”… what are they?
   ✓ It has been revised.

6) Line 43 should read “…. Resistant alloys. Surface treatment …”
   ✓ We have revised these sentences.

7) Line 43: “dissolvable” in what?
   ✓ It has been revised.

8) Line 49: reference 19 is not a single author paper
   ✓ Thank you for the reviewer’s suggestion. It has been revised.

9) Line 65: please remove “and”
   ✓ It has been removed.

10) Line 80: please remove “tests”.
    ✓ It has been removed.

11) Line 92: should read “mm³”.
    ✓ It has been revised.

12) Line 106: should read “film, which indicates that the film …”
    ✓ We have revised this sentence.

13) Please mention how the cross section sample is prepared.
    ✓ The preparation of the cross section samples has been added. See details in the section 2.2 in red font.

14) Line 122: please remove “anyhow”… such conjunctive adverbs are use
incorrectly in the whole manuscript.
✓ We have removed this adverb. And the other revisions are emphasized in red.

15) Line 130: please remove “whereas, also”
✓ It has been removed.

16) Line 141: please add “, respectively” before the new sentence.
✓ It has been added.

17) Line 147: please remove “corrosion”.
✓ It has been removed.

18) Line 180: please replace “depth” with “thickness”
✓ It has been revised.

19) Authors mention three layers but only present two layers. What is the third layer? The substrate or the cracked layer underneath HT?
✓ Yes, the third layer is the cracked layer underneath HT film, above the substrate. See detail in the followed figure in the red rectangle.

20) What is the mechanism of the formation of the cracked layer? Is it the film delamination?
✓ No, it is not caused by the film delamination. The mechanism of the formation of the cracked layer has been described in the paper as follows: There is an open crack, penetrating the two layers directly to the substrate. Those micro-cracks can provide channels for the corrosion medium passing through to the substrate. As a result, the Mg substrate under the film is corroded, and another loose and discontinuous corrosion products film layer is formed underneath the HT film. See details in paragraph 1 in page 6.

21) Line 191: this sentence shall be revised. From SEM images no compositional information can be obtained.
✓ This sentence has been removed.

22) Lien 203: should read “have been inserted”
✓ We have revised this sentence.
23) Line 204: should read “The corrosion products deposited on pit are composed …”
   ✓ We have revised this sentence.

24) Line 223: “tested” shall be replaced by “inserted or identified or …”
   ✓ “tested” is replaced by “identified”.

25) Line 224: “BE (binding energy)”
   ✓ It has been revised.

26) Section 3.5.A is very unclear. It is not clear which films in which solutions are discussed in this section. Discussions are jumping between the SBF and NaCl exposed samples.
   ✓ The pictures according to the corrosion behavior of the HT film in NaCl solution are not shown in this manuscript, which had been published in previous papers (reference [26] and [28]). Hence, it is a little jumping. We have revised this section carefully. And the revisions are emphasized in red.

27) Line 235: Please remove “Then, a”. Please use active tenses.
   ✓ It has been revised.

28) Line 251: please remove “whereas”.
   ✓ It has been removed.