Response to Reviewer:

1. The article title and Keywords should include a particular word such as ‘Biodegradable’ or ‘Biomedical’. The present title does not express the biodegradable Mg alloy.

   Thanks for your suggestion. The article title and keywords have been modified and these changes can be found from the lines 2~26, page 1.

   After modification:

   **Title**: Effects of extrusion on mechanical and corrosion resistance properties of biomedical Mg-Zn-Nd-Ca alloys;

   **Abstract**: Magnesium alloys act as an ideal biomedical material with good biocompatibility. In this paper, the extruded biomedical Mg-6Zn-0.5Nd-0.5/0.8Ca alloys were prepared.

2. The graph line colors should be unified among figures 2, 4, 5.

   Thanks for your suggestion. Referee’s comment is well taken and the lines in these three figures have been unified. After modification, the red and black lines in these three figures represent Mg-6Zn-0.5 Nd-0.8/0.5Ca alloys, respectively.

3. The extrusion process should be clearly described with the dimensions and the process rate, preferably with an illustration. Also the volume of SBF solution should be described in the evaluation of corrosion resistance.
Thanks for your suggestion. The preheating temperature before extrusion was 300 °C, and the extrusion speed was 8 m/min, and the extrusion ratio was 16:1, then the extruded specimens were aged at 200 °C for 12 h. Schematic diagram of extrusion process was displayed in Fig. 1.

![Schematic diagram of the extrusion process.](image)

**Figure 1.** Schematic diagram of the extrusion process.

4. Because this article has focused on ‘effect of extrusion’, this article should involve the results of the control materials without extrusion process, i.e. the specimens made from the cast ingot after solution treatment. Regarding the corrosion rate, it is preferable to compare with pure Mg or commercial Mg alloys.

Thanks for your suggestion. This article is based on previous work (10.1088/2053-1591/aa9b64). Previous work has studied the mechanical and corrosion properties of as-cast and heat-treated Mg-Zn-Nd-xCa alloys.
5. Regarding SEM images in Figure 1, the author suddenly stated the grain boundary and the secondary phase in the main text. However, the author should kindly explain the bright parts in the SEM images, e.g. precipitated solid solution with different crystal phase or Intergranular compounds / Intermetallic compounds. Preferably together with their chemical composition by EDX analysis. And the summary should add to the figure caption.

Thanks for your suggestion. EDS analysis (Fig. 3) of Mg-6Zn-0.5Nd-0.5Ca alloy is used to explain the "second phase" and "grain boundary". These changes can be found from the lines 123–131, page 4–5.

Lines 123–131, Page 4–5

Fig. 3 (a) showed the SEM image of extruded Mg-6Zn-0.5Nd-0.5Ca alloy. The extruded Mg-6Zn-0.5Nd-0.5Ca alloy was constituted of α-Mg matrix and secondary phase particles with the size from 0.8 to 12.4 μm. The EDS spectra of points 1, 2 and 3 in Fig. 3 (a) were shown in Fig. 3 (b), (c) and (d), respectively. The matrix phase mainly contained 98.17 at.% Mg and 1.83 at.% Zn, suggesting that the matrix phase was α-Mg phase. The white phases were composed of Mg, Zn, Nd and Ca, indicated that the Nd and Ca elements were mainly in the two precipitated phases (namely the Ca-rich and Nd-rich ones). The precipitation phase was spherical at point 1, and was strip at point 2.
6. It is well known that Mg, Zn, Ca are included in human body, however, the biocompatibility (the acute and chronic toxicity) of Nd is unknown. The author should discuss Nd as the alloy element for biodegradable implant. Thanks for your suggestion. We have added the introduction to the biocompatibility of the Nd element in the revised manuscript. The modified part can be found from the lines 52-53, page 2.

**Lines 52-53, Page 2**

Furthermore, the recent report claimed that a small amount of neodymium (Nd) was not toxic to humans [18].