Effects of Incorporating B-Tricalcium Phosphate with Reaction Sintering into Mg-Based Composites on Degradation and Mechanical Integrity

Kai Narita 1,*,†, Sachiko Hiromoto 2, Equo Kobayashi 1 and Tatsuo Sato 3

1 Department of Metallurgy and Ceramics Science, Tokyo Institute of Technology, 2-12-1 Ookayama, Meguro-ku, Tokyo 152-8552, Japan; equo@mtl.titech.ac.jp
2 Corrosion Property Group, Research Center for Structural Materials, National Institute for Materials Science, 1-2-1 Sengen, Tsukuba 305-0047, Japan; hiromoto.sachiko@nims.go.jp
3 Tokyo Institute of Technology, Tokyo 152–8552, Japan; sato.tatsuo8@gmail.com
* Correspondence: kai.y.narita@gmail.com
† Current address: Division of Engineering and Applied Sciences, California Institute of Technology, Pasadena, CA 91125, USA.

Figure S1. Optical microscopic image of Mg particles. L shows the length of the longest distance of a Mg particle contour.

Figure S2. Histogram of Mg particle size measured from optical microscope images
**Table S1.** Impurity of magnesium powder.

<table>
<thead>
<tr>
<th>Element</th>
<th>Al</th>
<th>Ca</th>
<th>Cu</th>
<th>Fe</th>
<th>Mn</th>
<th>Pb</th>
<th>Si</th>
<th>Zn</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>%</td>
<td>0.03</td>
<td>0.008</td>
<td>ND</td>
<td>0.009</td>
<td>0.01</td>
<td>ND</td>
<td>0.02</td>
<td>0.006</td>
<td>0.083</td>
</tr>
</tbody>
</table>

*ND: Not Detected.

**Figure S3.** The boundary of sintered Mg particles obtained by Auger electron microscopy. (a) secondary electron image, (b) elemental mapping of Mg, and (c) elemental mapping of O.

**Figure S4.** Ultimate compressive strength of Mg/bredigite [1], Mg-3Zn/5wt.%HA [2], Mg-2.5Zn-0.5Si/1wt.%HA [3], and Mg/β-TCP (our work).

**Reference**