6. The magnesium alloy as claimed in claim 1, characterized in that, with a combination of the impurity elements Fe, Si, Mn, Co, Ni, Cu and Al, the sum of these impurities is no more than 0.004% by weight, preferably no more than 0.001% by weight, the content of Al is no more than 0.001% by weight, and/or the content of Zr is preferably no more than 0.0003% by weight, preferably no more than 0.0001% by weight.

7. The magnesium alloy as claimed in claim 1, characterized in that the individual elements from the group of rare earths in the total amount are no more than 0.001, preferably no more than 0.0003 and particularly preferably no more than 0.0001% by weight.

8. The magnesium alloy as claimed in any one of the preceding claims 1 to 7, characterized in that the alloy has a fine-grain microstructure with a grain size of no more than 5.0 µm, preferably no more than 3.0 µm and particularly preferably no more than 1.0 µm without considerable electrochemical potential differences between the individual matrix phases.

9. The magnesium alloy as claimed in any one of the preceding claims 1 to 8, characterized in that the intermetallic phases $Ca_2Mg_6Zn_3$ and Mg_2Ca are ~~at least~~ as noble as the matrix phase or are less noble than the matrix phase.

10. The magnesium alloy as claimed in one of claims 2, 3 or 9, characterized in that the precipitates have a size of no more than 2.0 µm, preferably no more than 1.0 µm, particularly preferably no more than 200 nm, and are distributed dispersely at the grain boundaries or inside the grain.

11. The magnesium alloy as claimed in any one of the preceding claims 1 to 10, characterized in that it has a strength of > 275 MPa, preferably > 300 MPa, a yield point of > 200 MPa, preferably > 225 MPa, and a ratio yield point of < 0.8, preferably < 0.75, wherein the difference between strength and yield point is > 50 MPa, preferably > 100 MPa, and the mechanical asymmetry is < 1.25.

12. A biologically degradable implant, in particular a cardiovascular stent, comprising the magnesium alloy as claimed in any preceding claim.

~~12~~13. A method for producing a magnesium alloy having improved mechanical and electrochemical properties, said method comprising the following steps

a) producing a highly pure magnesium by means of vacuum distillation;

b) producing a cast billet of the alloy by means of synthesis of the magnesium according to step a) with a composition according to one or more of claims 1 to 11;

c) homogenizing the alloy at least once and, in so doing, bringing the alloy constituents into complete solution by annealing in one or more annealing steps at one or more successively increasing temperatures between 300°C and 450°C with a holding period of 0.5 h to 40 h in each case;

d) optionally ageing the homogenized alloy between 100 and 450°C for 0.5h to 20 h;

e) forming the homogenized alloy at least once in a simple manner in a temperature range between 150°C and 375°C;

f) optionally ageing the homogenized alloy between 100 and 450°C for 0.5h to 20 h;

g) selectively carrying out a heat treatment of the formed alloy in the temperature range between 100°C and 325°C with a holding period from 1 min to 10 h.

~~13~~14. The method as claimed in claim ~~12~~13, characterized in that the phases $Ca_2Mg_6Zn_3$ and/or Mg_2Ca from the alloy matrix, said phases being less noble than the alloy matrix, are precipitated out before, during and/or after the forming process and the potential difference existing between the alloy matrix and the $Ca_2Mg_6Zn_3$ and/or Mg_2Ca precipitates is used to set the degradation rate of the alloy matrix.

~~14~~15. The method as claimed in one of claims ~~12~~ 13 or ~~13~~14, characterized in that the grain refinement during the forming process is produced by the intermetallic phases $Ca_2Mg_6Zn_3$ and/or Mg_2Ca instead of the Zr particles or the particles containing Zr.

~~15~~16. The method as claimed in one of claims ~~12~~ 13 to ~~14~~15, characterized in that the $Ca_2Mg_6Zn_3$ and/or Mg_2Ca precipitates after the heat treatment have a size of ≤ 2.0 µm, preferably no more than 1.0 µm, particularly preferably no more than 200 nm and, in a fine-grain structure with a grain size of no more than 5.0 µm, preferably no more than 2.0 µm, are distributed dispersely at the grain boundaries and in the grain.