5. The magnesium alloy according to claim 1, characterized in that when the impurity elements Fe, Si, Mn, Co, Ni, and Cu are combined, the sum of these impurities in % by weight is no more than 0.0030, preferably no more than 0.0021, and particularly preferably no more than 0.0009.

6. The magnesium alloy according to claim 2, characterized in that the alloy has a fine-grained microstructure having a grain size of < 7.5 µm, preferably <5 µm, and still more preferably < 2.5 µm, without considerable electrochemical potential differences between the individual matrix phases.

7. The magnesium alloy according to claim 3, characterized in that the alloy matrix contains only such precipitations which have no considerable electrochemical potential differences~~, or potential differences as small as possible,~~ as compared to the matrix, or which are less noble than the matrix.

8. The magnesium alloy according to claim 1, characterized in that the precipitations have a size of no more than 1 µm, and preferably < 0.2 µm, and are dispersely distributed at the grain boundaries or in the grain interior.

9. The magnesium alloy according to claim 1, characterized in that it has a tensile strength of ≥275 MPa, and preferably ≥300 MPa, a yield point of ≥200 MPa, and preferably ≥225 MPa, and a yield ratio of <0.8, and preferably <0.75, wherein the difference between the tensile strength and yield point is ≥50 MPa, and preferably ≥100 MPa, and the mechanical asymmetry is <1.25.

10. A method for producing a magnesium alloy having improved mechanical and electrochemical properties, comprising the following steps:
    a) generating high-purity magnesium by way of vacuum distillation;
    b) generating a billet of the alloy by synthesis of the magnesium according to step a) with high-purity Zn and Al in a composition of 1.5 to 7.0% by weight Zn, 0.5 to 3.5% by weight Al, the remainder being magnesium containing

14. The method according to claim 10 or claim 12, characterized in that the alloying elements are contained in an amount slightly above the solubility limit, and the precipitations from the forming and heat treatment processes at temperatures below the solubility limit, preferably in the range of 200ºC to 350ºC, are used to adjust the strength.

15. The method according to claim 13 or claim 14, characterized in that the precipitations have a size of no more than 1 µm, and preferably < 0.2 µm, and are dispersely distributed at the grain boundaries or in the grain interior.

16. The method according to claim 10, characterized in that the individual impurities in the total sum of impurities amount to the following in % by weight: Fe <0.0005; Si <0.0005; Mn <0.0005; Co <0.0005; Ni <0.0005; Cu <0.0005; Zr <0.0003; Y <0.0003; Sc or rare earths having the ordinal numbers 21, 57 to 71 and 89 to 103 <0.0010; Be, Cd, In, Sn and/or Pb each with <0.0003; and P <0.0002.

17. The method according to claim 10, characterized in that when the impurity elements Fe, Si, Mn, Co, Ni, and Cu are combined, the sum of these impurities in % by weight is no more than 0.0040, preferably no more than 0.020, and particularly preferably no more than 0.0010.

18. The method according to claim 10, characterized in that the forming process is an extrusion, equal channel angular extrusion (EACE) and/or multiple forging process.

19. Use of a magnesium alloy according to any one of the claims 1 to 9 for producing a biodegradable implant.

20. Use of a magnesium alloy according to claim 19, characterized in that the implant is elected from the group of endovascular implants such as stents, implants for fastening and temporarily fixing tissue implants and tissue transplantations, orthopedic and dental implants, and neuroimplants.