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 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