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Natural aging is a process where solute atoms and vacancies cluster at room temperature in materials quenched from high annealing temperature. It is well known effect and was thoroughly investigated in Al-based alloys [1-4]. Significant strengthening occurs because solute clusters develop during natural aging. Contrary to Al-based alloys, natural aging of Mg-based is not common. So far, natural aging was observed in Mg-Zn-based alloys [5] and, recently, in our work in Mg-Gd and Mg-Tb alloys [6].

Conclusions

Natural aging of Mg-Gd and Mg-Tb alloys associated with clustering of solute atoms was observed in this work. Theoretical model of hardening during natural aging showing good agreement with experimental data was developed.

Quenched in vacancy-Gd (or Tb) pairs are present in solution treated alloys after quenching. Quenched-in vacancy-Gd (or Tb) pairs at solution treatment consist of two components with lifetimes 0.368 and 1.5 ns with relative intensities 8% and 1%, respectively.

References