

# QUASIPERIODIC AND RELATED PERIODIC INTERMETALLICS IN ALLOY SYSTEMS OF ALUMINUM WITH TRANSITION METALS

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Extensive investigation of alloy phase diagrams of aluminum with transition metals (TM) was stimulated by discovery there quasiperiodic phases (quasicrystals, QC). A significant number of QCs was found to be stable in ternary alloys while the boundary binaries only exhibited the formation of metastable QCs. In total, QCs were observed in all binary systems of Al with the d-TMs from V to Ni, from Mo to Pd and from W to Pt. The stable Al-based QCs are associated with one of the three groups containing the above mentioned TMs: Al-Cu-TM, Al-Pd-TM and Al-Ni-TM. The compositions of QCs vary in the limits between 60 to 85 at.% Al. A great number of stable and metastable phases resembling QCs was observed in the same compositional ranges.

In this contribution we discuss the phenomenology of the formation of QCs and the related periodic phases in these alloy systems. Updates which were not included yet in the popular reference sources include binary Al-TM systems (TM=Cr,Co,Mo,Ru,Rh,Pd,Re,Ir). The following ternary alloy systems are reviewed: Al-Ni-TM (TM=Cr,Fe,Co,Mo,Ru,Rh), Al-Cu-TM (TM=Cr,Fe,Co,Mo,Ru,Rh) and Al-Pd-TM (TM=Fe,Co,Ru,Rh,Re). A significant part of these phase diagrams was studied by the research groups of the present authors.