Cu – Mg (Copper – Magnesium)
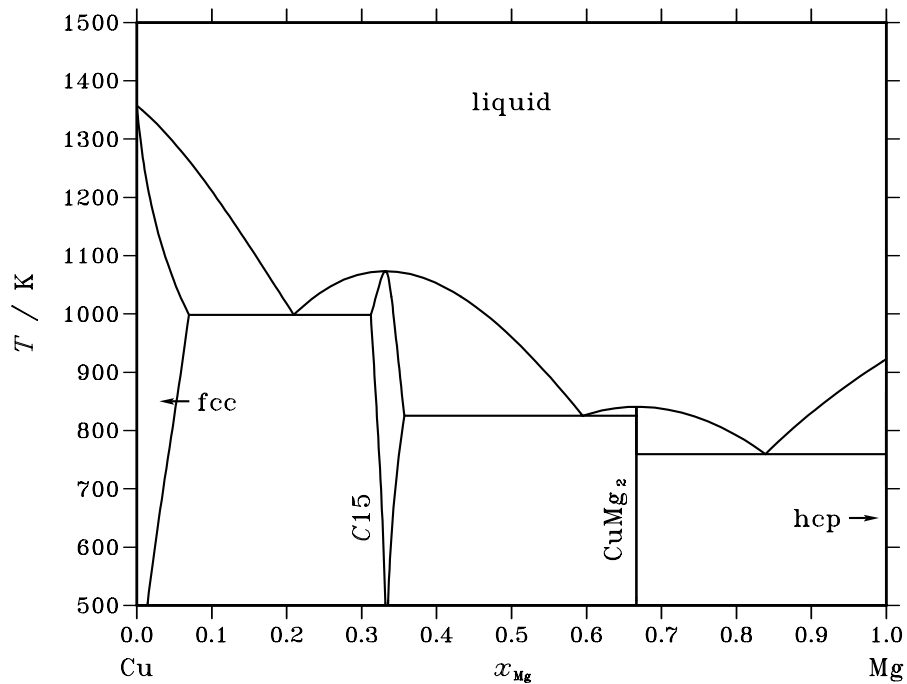

Fig. 1. Calculated phase diagram for the system Cu-Mg.

The copper-magnesium system is part of Al-Cu-Mg-Zn which has been investigated in the framework of the COST 507 program on light metal alloys. The selected assessment has been performed by Coughanowr *et al.* [91Cou]. The experimental data has been critically reviewed by Nayeb-Hashemi and Clark [84Nay]. Two congruent melting intermetallic compounds are known in the system: stoichiometric $CuMg_2$ and the cubic Laves phase Cu_2Mg ($C15$) which has a homogeneity range of a few at.%. The solubility of Cu in solid Mg is negligible and an experimental value of 0.013 at.% Cu is given at the eutectic liquid$\rightleftharpoons CuMg_2$+hcp. The maximum solubility of Mg in solid Cu is 6.9 at.% Mg at the eutectic liquid$\rightleftharpoons$fcc+$C15$. The assessment is in good agreement with the experimental liquidus and the invariant points as determined by Jones [31Jon] and Bagnoud *et al.* [78Bag] and all the thermodynamic data cited in [84Nay].

Table I. Phases, structures and models.

Phase	Struktur-bericht	Prototype	Pearson symbol	Space group	SGTE name	Model
liquid					LIQUID	$(Cu,Mg)_1$
fcc	$A1$	Cu	$cF4$	$Fm\overline{3}m$	FCC_A1	$(Cu,Mg)_1$
$C15$	$C15$	Cu_2Mg	$cF24$	$Fd\overline{3}m$	LAVES_C15	$(Cu,Mg)_2(Cu,Mg)_1$
$CuMg_2$	C_b	$CuMg_2$	$oF48$	$Fddd$	CUMG2	Cu_1Mg_2
hcp	$A3$	Mg	$hP2$	$P6_3/mmc$	HCP_A3	$(Cu,Mg)_1$