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Supporting information for article:

Structure and stability of γ1-AuZn2.1: a γ-brass-related complex phase in the Au–Zn System

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Table S1   Table of PXRD refinement analysis and present phases.

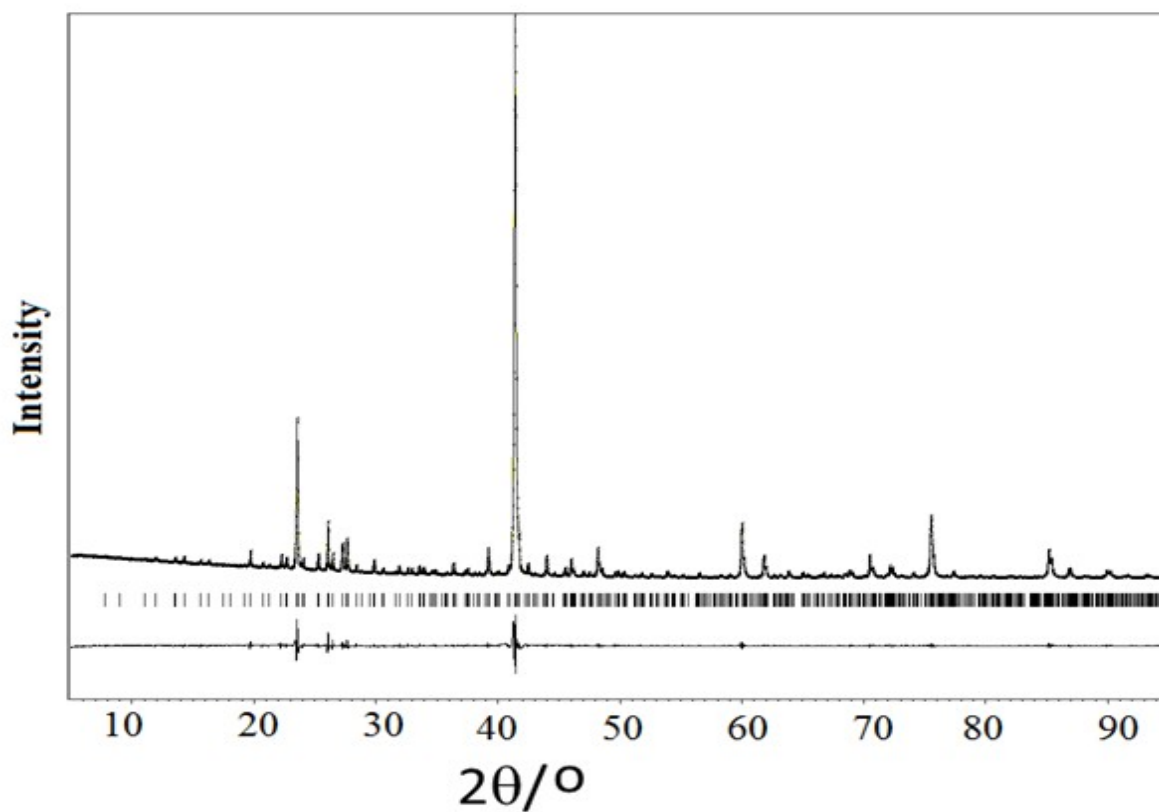| Loaded composition	Main phase $P31m$ (157)	$Au_{5-x}Zn_{8+y}$ $R3m$ (160)	$AuZn_3$ $Pm\bar{3}n$(223)	β' –AuZn $Pm\bar{3}m$(221)
$AuZn_{1.7}$	+	+	-	+
$AuZn_{1.8}$	+	+	-	-
$AuZn_{1.9}$	+	+	-	-
$AuZn_{2.0}$	+	-	-	-
$AuZn_{2.1}$	+	-	-	-
$AuZn_{2.3}$	+	-	+	-

Figure S1: Observed and calculated X-ray powder diffractogram of $AuZn_{2.1}$ over the 2θ range 10-90° along with the profile fit, the difference spectrum and the Bragg positions. $Cu_{K\alpha}$; R_p=3.79%, wR_p=5.58%.
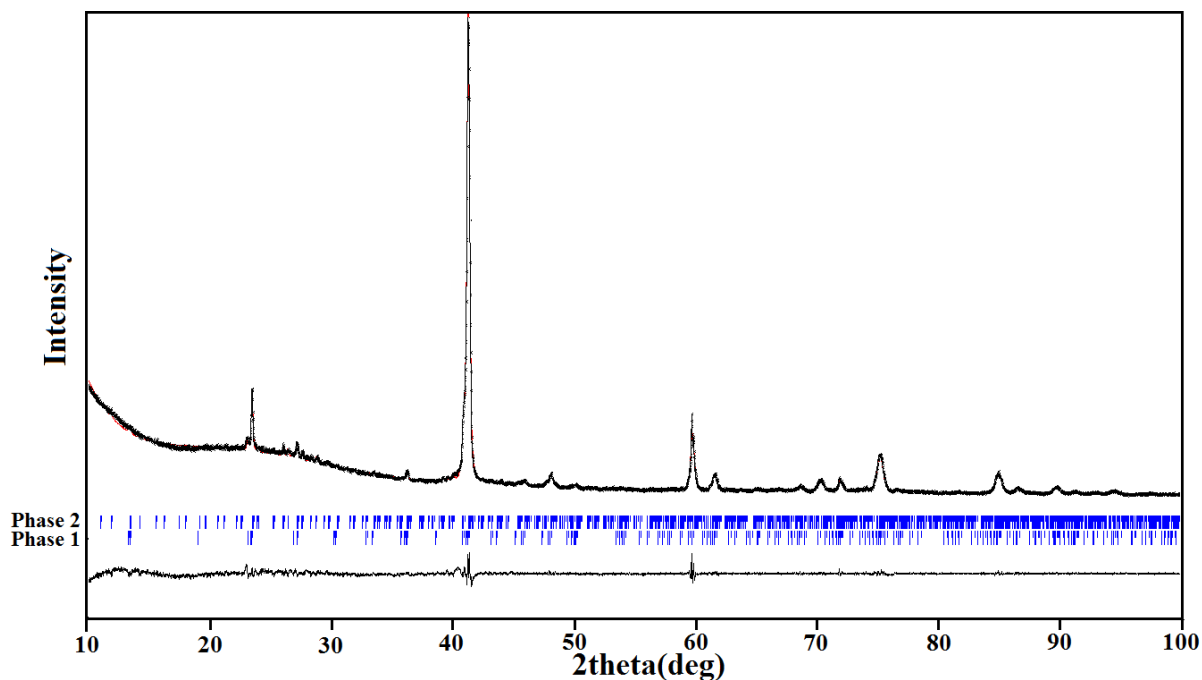
Figure S2: Observed and calculated X-ray powder diffractogram of sample with nominal composition $AuZn_{1.9}$ over the 2θ range $10\text{-}100^O$ along with the profile fit, the difference spectrum (black) and the Bragg positions (blue). Phase 1 and 2 are $\gamma\text{-}Au_{5-x}Zn_{8+y}$ and $\gamma_1\text{-}AuZn_{2.1}$. $Cu_{K\alpha}$; Rp=3.27%, wRp=4.30%.
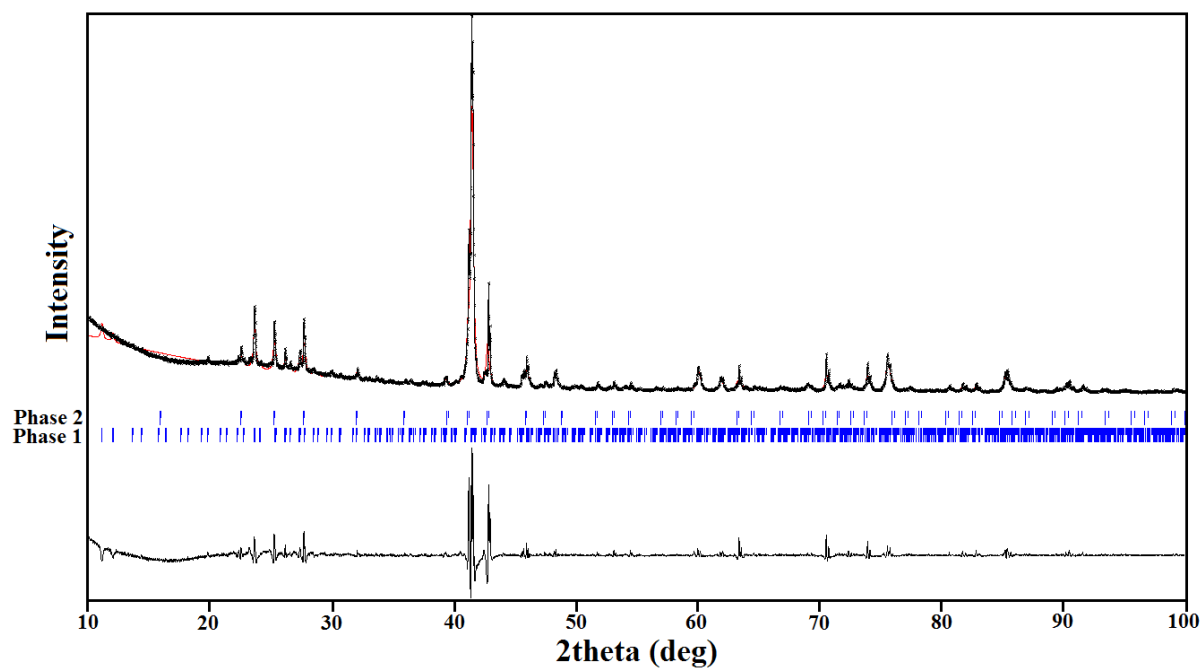

Figure S3: Observed and calculated X-ray powder diffractogram of sample with nominal composition $AuZn_{2.3}$ over the 2θ range $10\text{-}100^O$ along with the profile fit, the difference spectrum

(black) and the Bragg positions (blue). Phase 1 and 2 are γ_1-AuZn$_{2.1}$ and AuZn$_3$. Cu$_{K\alpha}$; Rp=8.82%, wRp=12.90%.
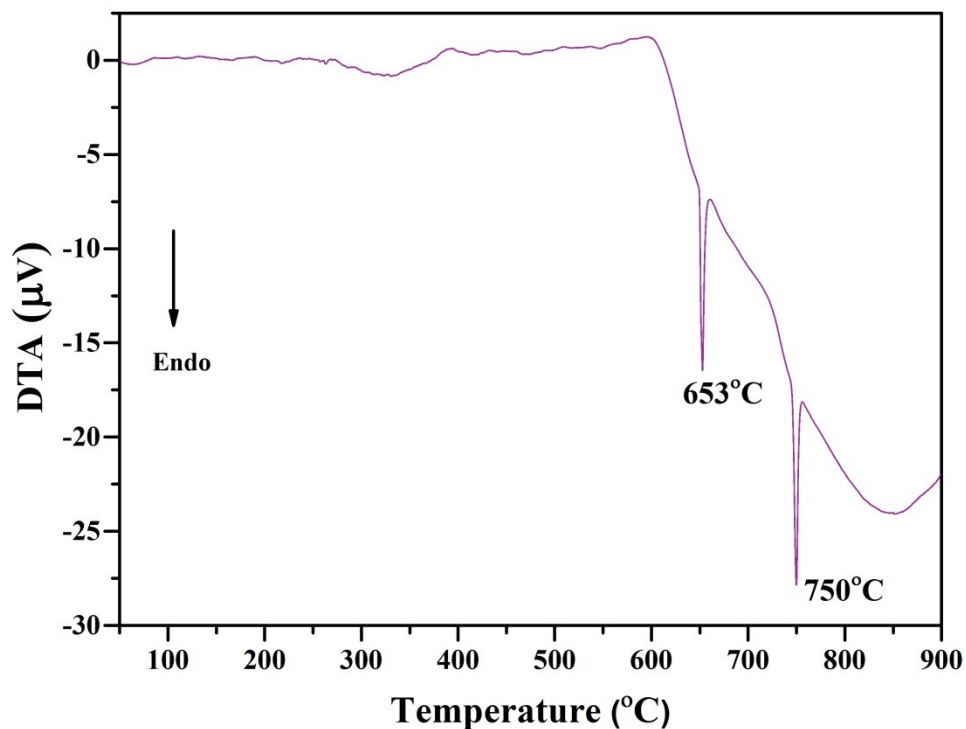

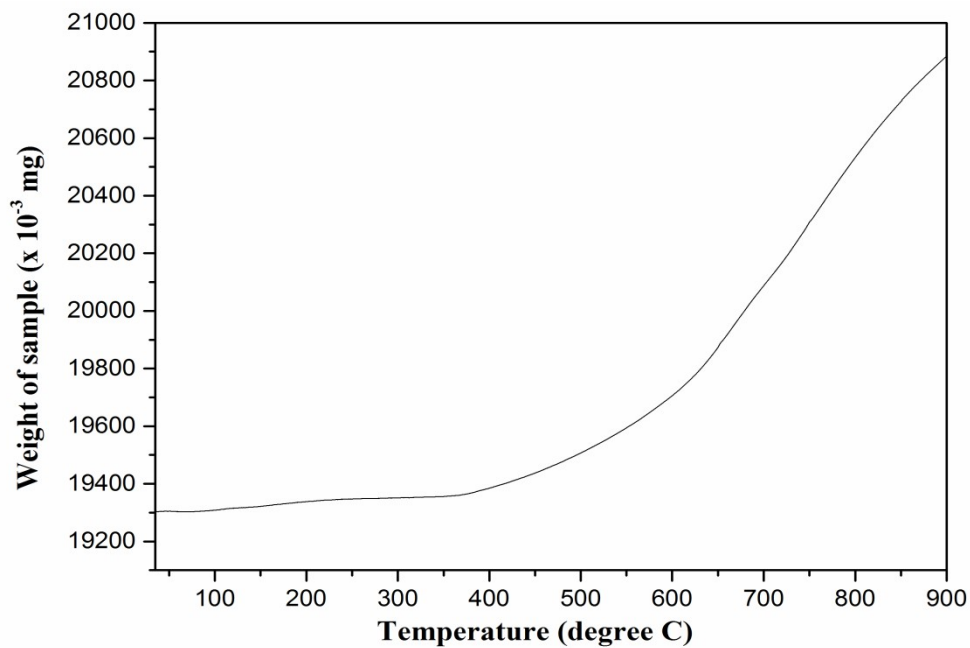Figure S4: Thermo-chemical analysis (Differential thermal analysis) of AuZn$_{2.1}$.

Figure S5: Thermo gravimetric analysis of AuZn$_{2.1}$. From 370°C there is continuous gain in weight (total ~8%) due to oxidation of zinc by impure oxygen present in purged argon.