

# 固溶体AgCu合金ナノ粒子

## 処方

### A液

- AgNO<sub>3</sub>
- Cu(NO<sub>3</sub>)<sub>2</sub> · 3H<sub>2</sub>O
- Ethylene glycol

### B液

- KOH
- Polyvinylpyrrolidone
- N<sub>2</sub>H<sub>4</sub> · H<sub>2</sub>O
- Dimethyl amino ethanol
- Ethylene glycol

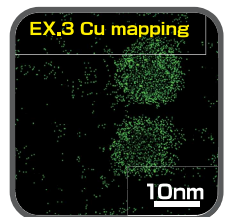
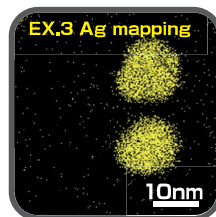
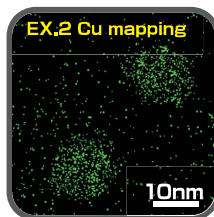
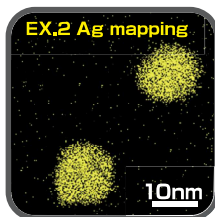
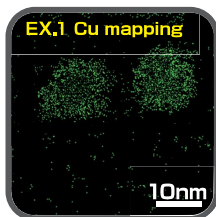
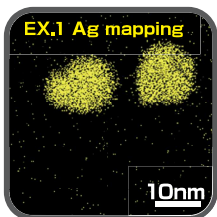
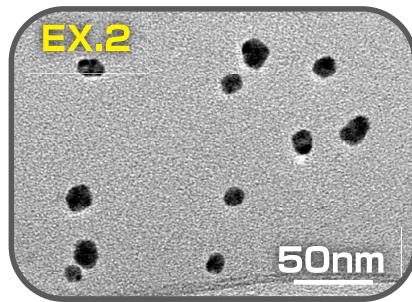
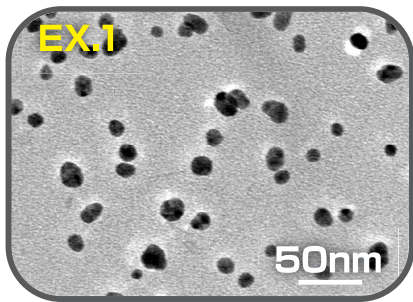
at 160°C



at 25°C

ULREA® を用いて混合・反応

組成分析結果			Ag	Cu
			[mol%]	
EX.1	ICP	A液	85.0	15.0
		powder	85.5	14.5
TEM-EDS			85.5	14.5
EX.2	ICP	A液	70.0	30.0
		powder	69.9	30.1
TEM-EDS			70.0	30.0
EX.3	ICP	A液	50.0	50.0
		powder	50.3	49.7
TEM-EDS			50.9	49.1



Ag:85.0(mol%)

Cu:15.0(mol%)

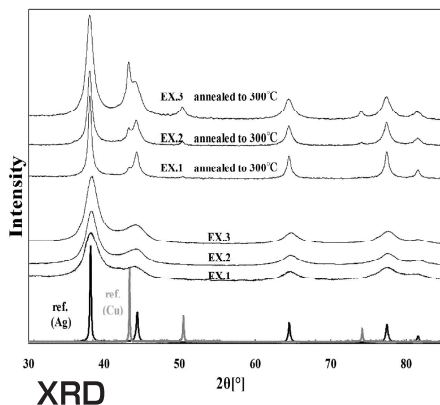
Ag:67.9(mol%)

Cu:32.1(mol%)

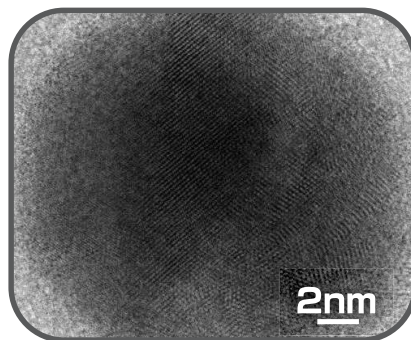
Ag:51.2(mol%)

Cu:48.8(mol%)

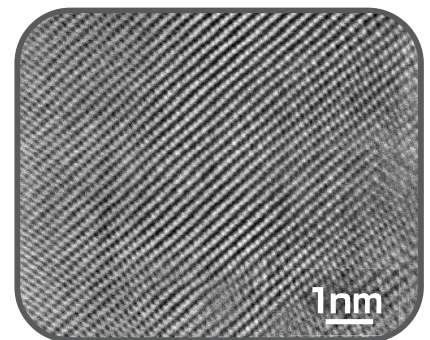
- 10-20nm程度の結晶性ナノ粒子の生成を確認
- Ag:Cu比は仕込み比率と一致(ICP結果と粒子のEDS結果が一致)



XRD



STEM 観察倍率 1000万



STEM 観察倍率 2000万

- FCC構造のAgに近い回折のみを確認
- 熱処理後はAgとCuの混合物

- 結晶格子の干渉縞が、うねりをもって観察された
- 原子半径の差異により結晶格子が歪むことによるもの ⇒ 銀と銅が固溶体化