

Fig 1. Diffuse reflectance spectra of silver nanoparticles obtained by using different precursors: (a) AgNO_3 , (b) Ag_2SO_4 , (c) $\text{C}_6\text{H}_5\text{Ag}_3\text{O}_7$.

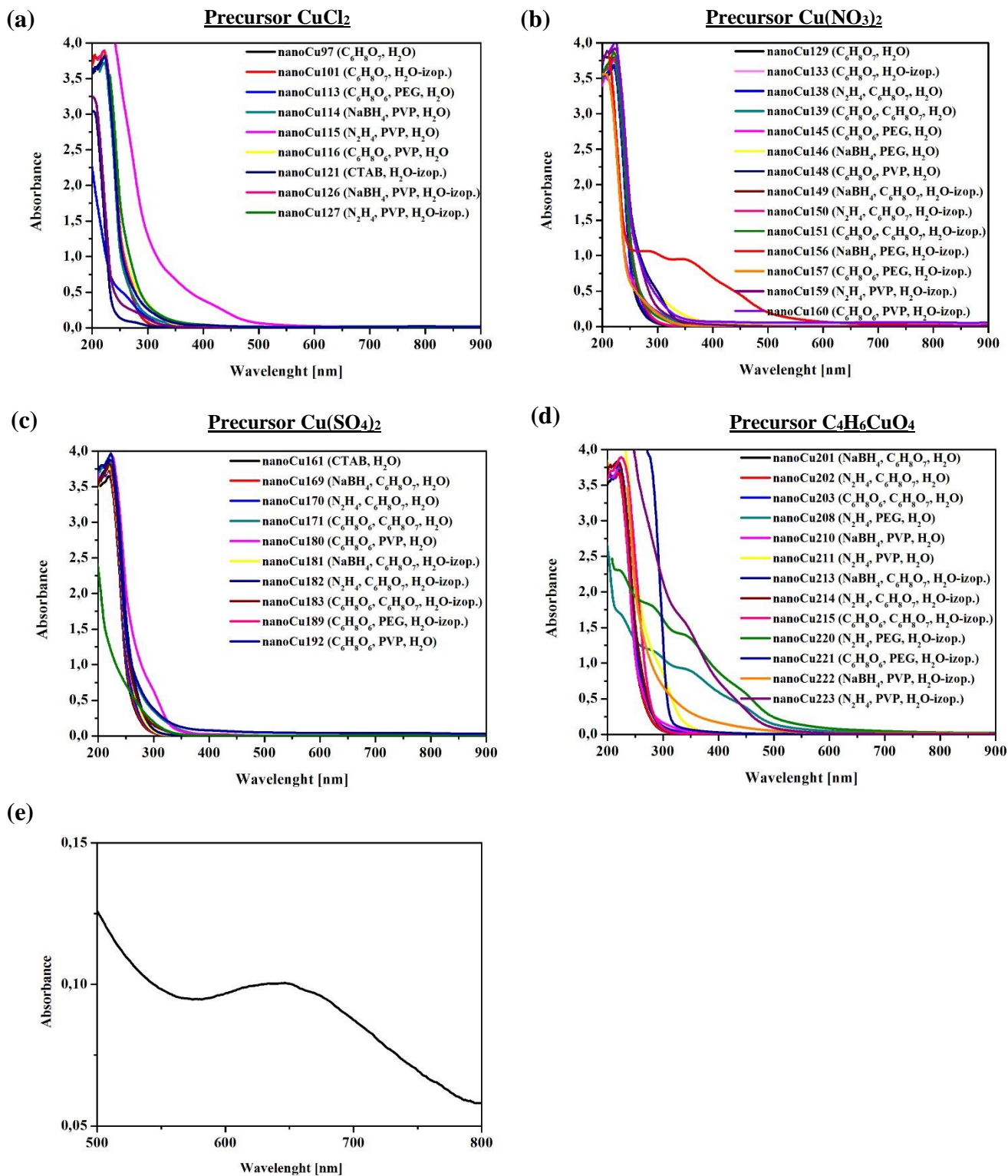


Fig. 2 Diffuse reflectance spectra of copper nanoparticles obtained by using different precursors: (a) CuCl_2 , (b) $\text{Cu}(\text{NO}_3)_2$, (c) $\text{Cu}(\text{SO}_4)_2$, (d) $\text{C}_4\text{H}_6\text{CuO}_4$, (e) characteristic peak of the copper nanoparticles prepared with $\text{C}_4\text{H}_6\text{CuO}_4$.

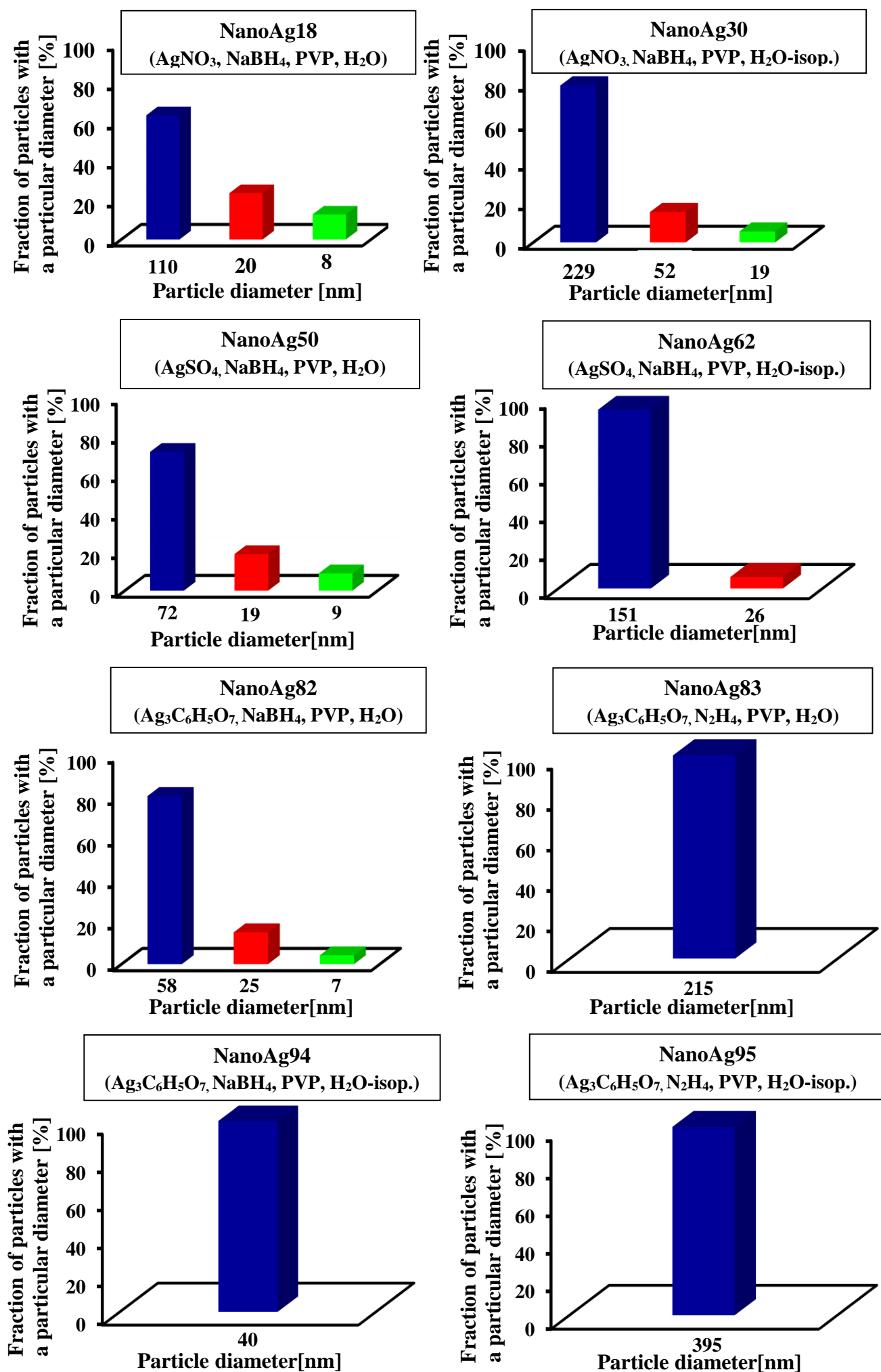


Fig 3. Particle size distribution of silver nanoparticles.

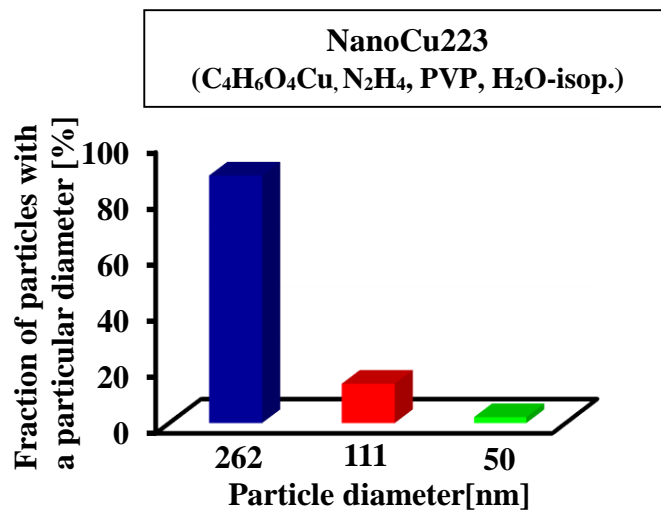
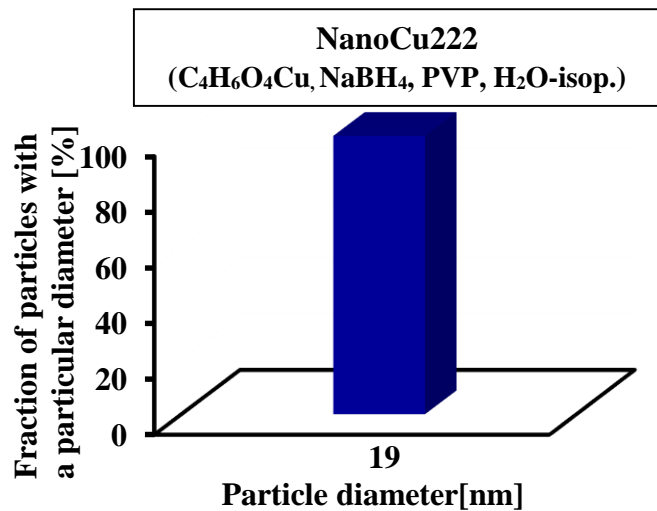
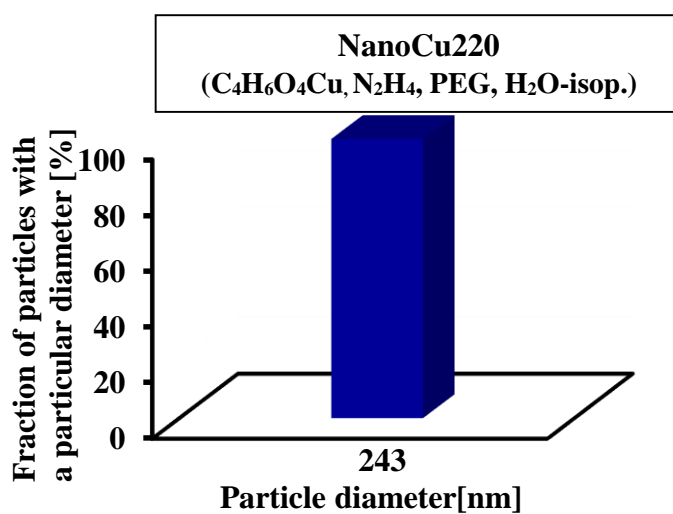
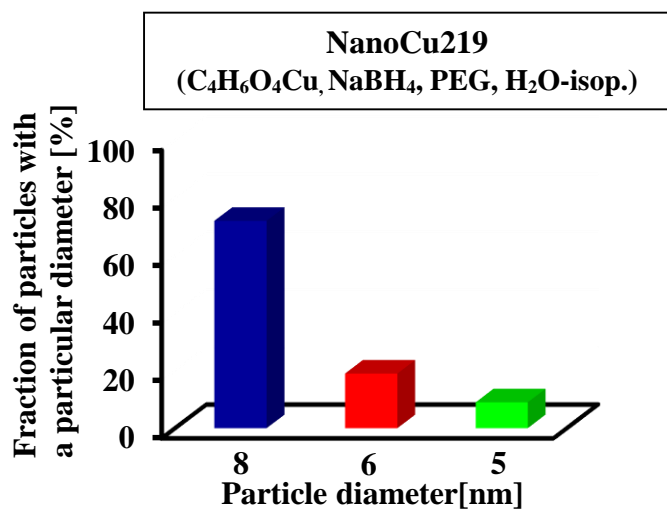
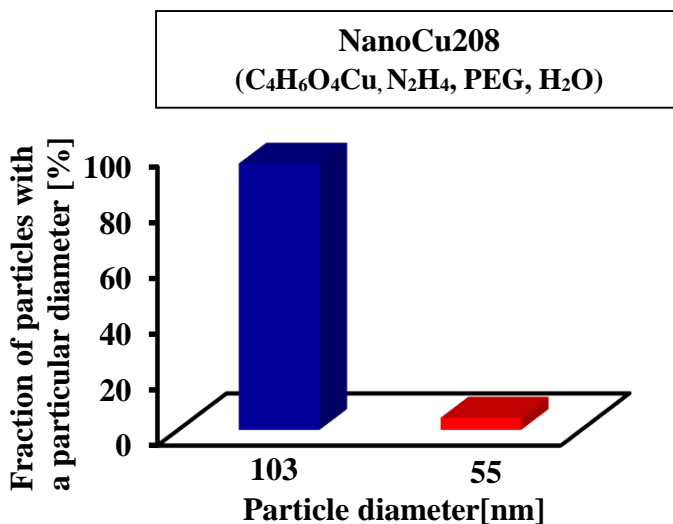
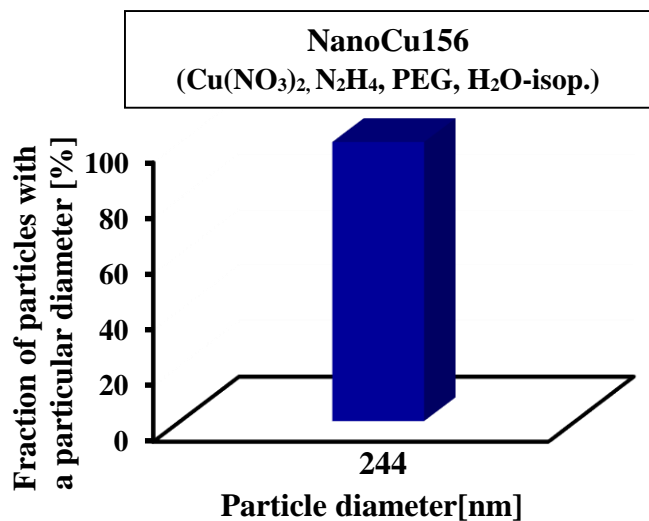


Fig 4. Particle size distribution of copper nanoparticles.

Table 1. The composition and stability of the solutions containing silver or copper in an ionic form or nanoparticles (monometallic solutions)

Sample label	Silver precursor			Copper precursor				Reducing agent			Stabilizer				Solvent		Stability
	AgNO ₃	Ag ₂ SO ₄	Ag ₃ C ₆ H ₅ O ₇	CuCl ₂	Cu(NO ₃) ₂	CuSO ₄	C ₄ H ₆ O ₄ Cu	NaBH ₄	N ₂ H ₄	C ₆ H ₈ O ₆	CTAB	C ₆ H ₈ O ₇	PEG	PVP	H ₂ O	2-propanol	
nanoAg1	X											X			X		stable
nanoAg2	X							X							X		-
nanoAg3	X								X						X		-
nanoAg4	X									X					X		-
nanoAg5	X											X				X	stable
nanoAg6	X							X								X	-
nanoAg7	X								X							X	-
nanoAg8	X									X						X	-
nanoAg9	X							X				X			X		-
nanoAg10	X								X			X			X		-
nanoAg11	X									X		X			X		-
nanoAg12	X										X				X		-
nanoAg13	X										X				X		-
nanoAg14	X										X				X		-
nanoAg15	X							X					X		X		-
nanoAg16	X								X				X		X		-
nanoAg17	X									X			X		X		-
nanoAg18	X							X						X	X		stable
nanoAg19	X								X					X	X		-
nanoAg20	X									X				X	X		-
nanoAg21	X							X				X				X	-
nanoAg22	X								X			X				X	-
nanoAg23	X									X		X				X	-
nanoAg24	X										X					X	-
nanoAg25	X										X					X	-
nanoAg26	X										X					X	-
nanoAg27	X							X					X			X	-

Tabele 1. The composition and stability of the solutions containing silver or copper in an ionic form or nanoparticles (monometallic solutions), cont.

Sample label	Silver precursor			Copper precursor				Reducing agent			Stabilizer				Solvent		Stability
	AgNO ₃	Ag ₂ SO ₄	Ag ₃ C ₆ H ₅ O ₇	CuCl ₂	Cu(NO ₃) ₂	CuSO ₄	C ₄ H ₆ O ₄ Cu	NaBH ₄	N ₂ H ₄	C ₆ H ₈ O ₆	CTAB	C ₆ H ₈ O ₇	PEG	PVP	H ₂ O	2-propanol	
nanoAg28	X								X				X			X	-
nanoAg29	X									X			X			X	-
nanoAg30	X							X						X		X	stable
nanoAg31	X								X					X		X	-
nanoAg32	X									X				X			-
nanoAg33		X										X			X		-
nanoAg34		X						X							X		-
nanoAg35		X							X						X		stable
nanoAg36		X								X					X		-
nanoAg37		X										X				X	-
nanoAg38		X						X								X	-
nanoAg39		X							X							X	stable
nanoAg40		X								X						X	-
nanoAg41		X						X				X			X		-
nanoAg42		X							X			X			X		-
nanoAg43		X								X		X			X		-
nanoAg44		X									X				X		-
nanoAg45		X									X				X		-
nanoAg46		X									X				X		-
nanoAg47		X						X					X		X		-
nanoAg48		X							X				X		X		stable
nanoAg49		X								X			X		X		-
nanoAg50		X						X						X	X		stable
nanoAg51		X							X					X	X		-
nanoAg52		X								X				X	X		-
nanoAg53		X						X				X				X	-
nanoAg54		X							X			X				X	stable

Tabele 1. The composition and stability of the solutions containing silver or copper in an ionic form or nanoparticles (monometallic solutions), cont.

Sample label	Silver precursor			Copper precursor				Reducing agent			Stabilizer				Solvent		Stability
	AgNO ₃	Ag ₂ SO ₄	Ag ₃ C ₆ H ₅ O ₇	CuCl ₂	Cu(NO ₃) ₂	CuSO ₄	C ₄ H ₆ O ₄ Cu	NaBH ₄	N ₂ H ₄	C ₆ H ₈ O ₆	CTAB	C ₆ H ₈ O ₇	PEG	PVP	H ₂ O	2-propanol	
nanoAg55		X								X		X				X	-
nanoAg56		X									X					X	-
nanoAg57		X									X					X	-
nanoAg58		X									X					X	-
nanoAg59		X						X					X			X	-
nanoAg60		X							X				X			X	stable
nanoAg61		X								X			X			X	-
nanoAg62		X						X						X		X	stable
nanoAg63		X							X					X		X	-
nanoAg64		X								X				X			-
nanoAg65			X									X			X		-
nanoAg66			X					X							X		-
nanoAg67			X						X						X		-
nanoAg68			X							X					X		-
nanoAg69			X									X				X	-
nanoAg70			X					X								X	-
nanoAg71			X						X							X	-
nanoAg72			X							X						X	-
nanoAg73			X					X				X			X		-
nanoAg74			X						X			X			X		stable
nanoAg75			X							X		X			X		-
nanoAg76			X								X				X		-
nanoAg77			X								X				X		-
nanoAg78			X								X				X		-
nanoAg79			X					X					X		X		-
nanoAg80			X						X				X		X		stable
nanoAg81			X							X			X		X		-

Table 1. The composition and stability of the solutions containing silver or copper in an ionic form or nanoparticles (monometallic solutions), cont.

Sample label	Silver precursor			Copper precursor				Reducing agent			Stabilizer				Solvent		Stability
	AgNO ₃	Ag ₂ SO ₄	Ag ₃ C ₆ H ₅ O ₇	CuCl ₂	Cu(NO ₃) ₂	CuSO ₄	C ₄ H ₆ O ₄ Cu	NaBH ₄	N ₂ H ₄	C ₆ H ₈ O ₆	CTAB	C ₆ H ₈ O ₇	PEG	PVP	H ₂ O	2-propanol	
nanoAg82			X					X						X	X		stable
nanoAg83			X						X					X	X		-
nanoAg84			X							X				X	X		-
nanoAg85			X					X				X				X	-
nanoAg86			X						X			X				X	stable
nanoAg87			X							X		X				X	-
nanoAg88			X								X					X	-
nanoAg89			X								X					X	-
nanoAg90			X								X					X	-
nanoAg91			X					X					X			X	-
nanoAg92			X						X				X			X	stable
nanoAg93			X							X			X			X	-
nanoAg94			X					X						X		X	stable
nanoAg95			X						X					X		X	stable
nanoAg96			X							X				X			-
nanoCu97				X								X			X		stable
nanoCu98				X				X							X		-
nanoCu99				X					X						X		-
nanoCu100				X						X					X		-
nanoCu101				X								X				X	stable
nanoCu102				X				X								X	-
nanoCu103				X					X							X	-
nanoCu104				X						X						X	-
nanoCu105				X				X				X			X		-
nanoCu106				X					X			X			X		-
nanoCu107				X						X		X			X		-
nanoCu108				X							X				X		-

Tabele 1. The composition and stability of the solutions containing silver or copper in an ionic form or nanoparticles (monometallic solutions), cont.

Sample label	Silver precursor			Copper precursor				Reducing agent			Stabilizer				Solvent		Stability
	AgNO ₃	Ag ₂ SO ₄	Ag ₃ C ₆ H ₅ O ₇	CuCl ₂	Cu(NO ₃) ₂	CuSO ₄	C ₄ H ₆ O ₄ Cu	NaBH ₄	N ₂ H ₄	C ₆ H ₈ O ₆	CTAB	C ₆ H ₈ O ₇	PEG	PVP	H ₂ O	2-propanol	
nanoCu109				X							X				X		-
nanoCu110				X							X				X		-
nanoCu111				X				X					X		X		-
nanoCu112				X					X				X		X		-
nanoCu113				X						X			X		X		stable
nanoCu114				X				X						X	X		stable
nanoCu115				X					X					X	X		stable
nanoCu116				X						X				X	X		stable
nanoCu117				X				X				X				X	-
nanoCu118				X					X			X				X	-
nanoCu119				X						X		X				X	-
nanoCu120				X							X					X	-
nanoCu121				X							X					X	stable
nanoCu122				X							X					X	stable
nanoCu123				X				X					X			X	-
nanoCu124				X					X				X			X	-
nanoCu125				X						X			X			X	-
nanoCu126				X				X						X		X	stable
nanoCu127				X					X					X		X	stable
nanoCu128				X						X				X			stable
nanoCu129					X							X			X		stable
nanoCu130					X			X							X		-
nanoCu131					X				X						X		-
nanoCu132					X					X					X		-
nanoCu133					X							X				X	stable
nanoCu134					X			X								X	-
nanoCu135					X				X							X	-

Table 1. The composition and stability of the solutions containing silver or copper in an ionic form or nanoparticles (monometallic solutions), cont.

Sample label	Silver precursor			Copper precursor				Reducing agent			Stabilizer				Solvent		Stability
	AgNO ₃	Ag ₂ SO ₄	Ag ₃ C ₆ H ₅ O ₇	CuCl ₂	Cu(NO ₃) ₂	CuSO ₄	C ₄ H ₆ O ₄ Cu	NaBH ₄	N ₂ H ₄	C ₆ H ₈ O ₆	CTAB	C ₆ H ₈ O ₇	PEG	PVP	H ₂ O	2-propanol	
nanoCu163						X			X						X		-
nanoCu164						X				X					X		-
nanoCu165						X						X				X	-
nanoCu166						X		X								X	-
nanoCu167						X			X							X	-
nanoCu168						X				X						X	-
nanoCu169						X		X				X			X		stable
nanoCu170						X			X			X			X		stable
nanoCu171						X				X		X			X		stable
nanoCu172						X					X				X		-
nanoCu173						X					X				X		-
nanoCu174						X					X				X		-
nanoCu175						X		X					X		X		-
nanoCu176						X			X				X		X		-
nanoCu177						X				X			X		X		-
nanoCu178						X		X						X	X		-
nanoCu179						X			X					X	X		-
nanoCu180						X				X				X	X		stable
nanoCu181						X		X				X				X	stable
nanoCu182						X			X			X				X	stable
nanoCu183						X				X		X				X	stable
nanoCu184						X					X					X	-
nanoCu185						X					X					X	-
nanoCu186						X					X					X	-
nanoCu187						X		X					X			X	-
nanoCu188						X			X				X			X	-
nanoCu189						X				X			X			X	stable

Table 1. The composition and stability of the solutions containing silver or copper in an ionic form or nanoparticles (monometallic solutions), cont.

Sample label	Silver precursor			Copper precursor				Reducing agent			Stabilizer				Solvent		Stability
	AgNO ₃	Ag ₂ SO ₄	Ag ₃ C ₆ H ₅ O ₇	CuCl ₂	Cu(NO ₃) ₂	CuSO ₄	C ₄ H ₆ O ₄ Cu	NaBH ₄	N ₂ H ₄	C ₆ H ₈ O ₆	CTAB	C ₆ H ₈ O ₇	PEG	PVP	H ₂ O	2-propanol	
nanoCu190						X		X						X		X	-
nanoCu191						X			X					X		X	-
nanoCu192						X				X				X			stable
nanoCu193							X					X			X		-
nanoCu194							X	X							X		-
nanoCu195							X		X						X		-
nanoCu196							X			X					X		-
nanoCu197							X					X				X	-
nanoCu198							X	X								X	-
nanoCu199							X		X							X	-
nanoCu200							X			X						X	-
nanoCu201							X	X				X			X		stable
nanoCu202							X		X			X			X		stable
nanoCu203							X			X		X			X		stable
nanoCu204							X				X				X		-
nanoCu205							X				X				X		-
nanoCu206							X				X				X		-
nanoCu207							X	X					X		X		-
nanoCu208							X		X				X		X		stable
nanoCu209							X			X			X		X		-
nanoCu210							X	X						X	X		stable
nanoCu211							X		X					X	X		stable
nanoCu212							X			X				X	X		stable
nanoCu213							X	X				X				X	stable
nanoCu214							X		X			X				X	stable
nanoCu215							X			X		X				X	stable
nanoCu216							X				X					X	-

Table 1. The composition and stability of the solutions containing silver or copper in an ionic form or nanoparticles (monometallic solutions), cont.

Sample label	Silver precursor			Copper precursor				Reducing agent			Stabilizer				Solvent		Stability
	AgNO ₃	Ag ₂ SO ₄	Ag ₃ C ₆ H ₅ O ₇	CuCl ₂	Cu(NO ₃) ₂	CuSO ₄	C ₄ H ₆ O ₄ Cu	NaBH ₄	N ₂ H ₄	C ₆ H ₈ O ₆	CTAB	C ₆ H ₈ O ₇	PEG	PVP	H ₂ O	2-propanol	
nanoCu217							X				X					X	-
nanoCu218							X				X					X	-
nanoCu219							X	X					X			X	stable
nanoCu220							X		X				X			X	stable
nanoCu221							X			X			X			X	-
nanoCu222							X	X						X		X	stable
nanoCu223							X		X					X		X	stable
nanoCu224							X			X				X			stable

Legend:

- AgNO₃ – silver nitrate
- Ag₂SO₄ – silver sulfate
- Ag₃C₆H₅O₇ - silver citrate
- CuCl₂ - copper chloride
- Cu(NO₃)₂ – copper nitrate
- CuSO₄– copper sulfate
- C₄H₆O₄Cu - copper acetate
- NaBH₄ - sodium borohydride
- N₂H₄ – hydrazine
- C₆H₈O - ascorbic acid
- CTAB - cetyltrimethylammonium bromide
- C₆H₈O₇- citric acid
- PEG - polyethylene glycol
- PVP - polyvinylpyrrolidone