

Supplementary Material

Microflow Injection System for Efficient Cu(II) Detection Across a Broad Range

David Ricart¹, Antonio David Dorado¹, Conxita Lao-Luque¹, Mireia Baeza^{2,*}

¹Department of Mining, Industrial and ICT Engineering, Escola Politècnica Superior d'Enginyeria de Manresa, Universitat Politècnica de Catalunya, Avinguda de les Bases de Manresa 61-73, 08240 Manresa, Spain

david.ricart.fort@upc.edu (D.R.); toni.dorado@upc.edu (A.D.D.); conxita.lao@upc.edu (C.L.-L.)

²GENOCOV Research Group, Department of Chemistry, Faculty of Science, Edifici C-Nord, Universitat Autònoma de Barcelona, Carrer dels Til·lers, 08193 Bellaterra, Spain

*Correspondence: mariadelmar.baeza@uab.cat

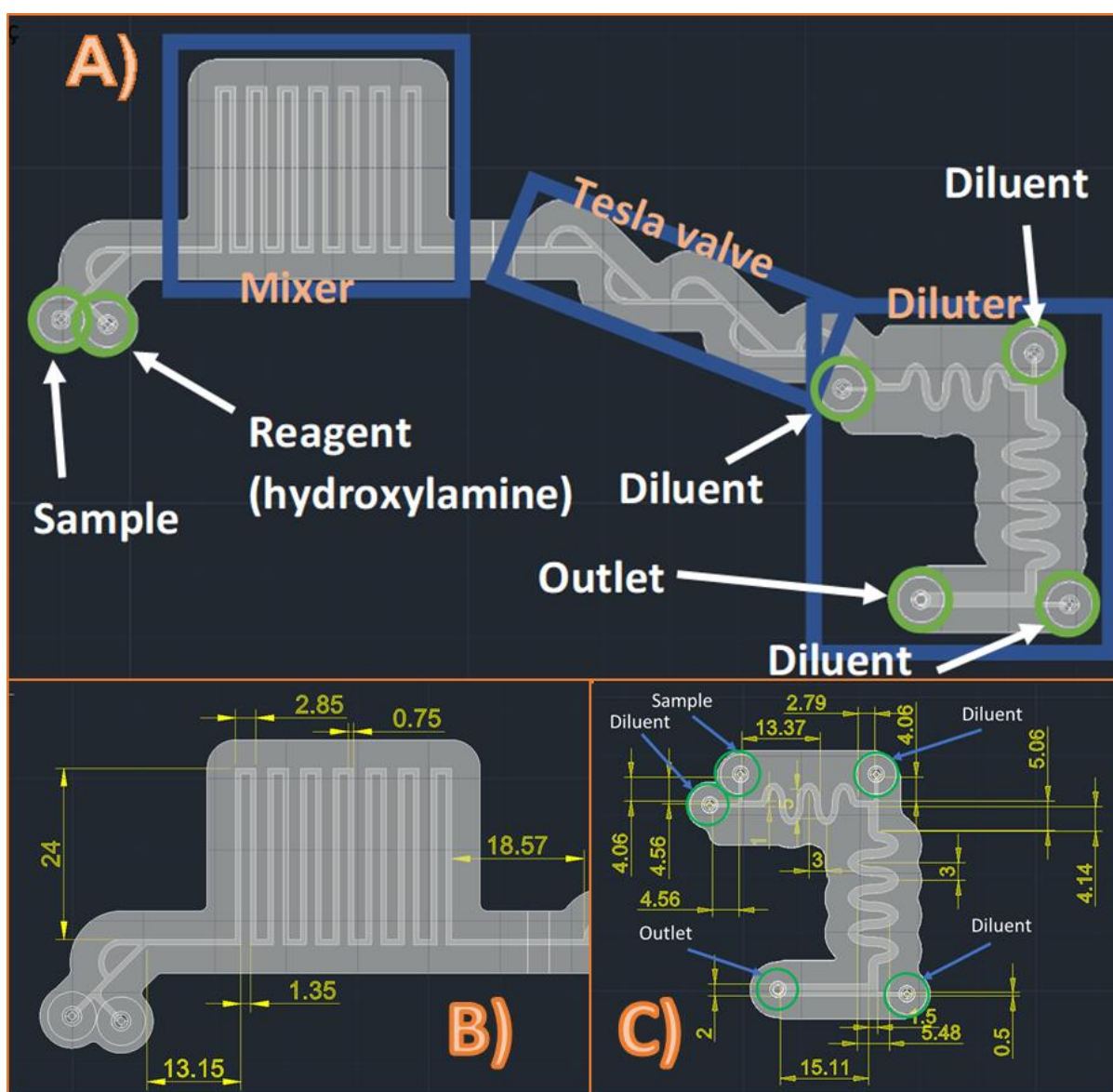


Figure S1. A) CAD of platform 1 formed by a hydroxylamine mixer module connected to a diluter module via a Tesla valve. B) Dimensional labelling of the hydroxylamine mixer with a height of 0.5 mm. C) Dimensional labelling of the diluter [47] with a height of 0.75 mm. The units for the dimensions are in millimeters.

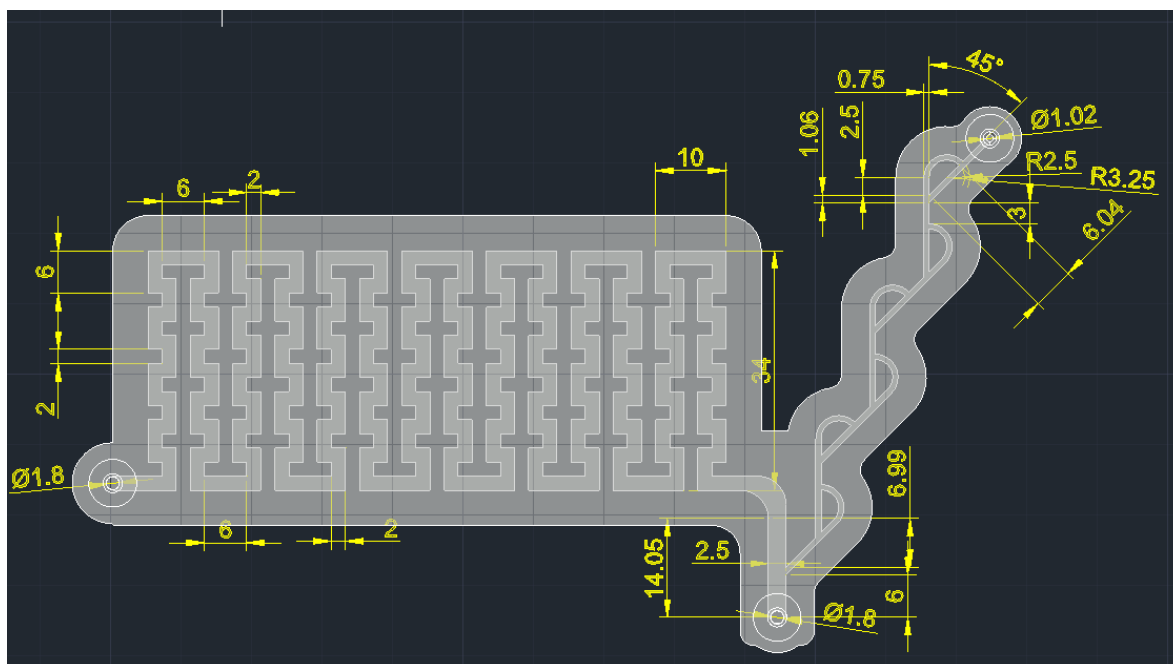


Figure S2. Dimensional labeling of the disperser [47] with a height of 1 mm with Tesla valve in CAD The units for the dimensions are in millimeters.

Table S1. Results of repeatability of the modular micro-FIA system.

Copper concentration (mg L ⁻¹)	Mean (mg L ⁻¹)	Standard deviation (mg L ⁻¹)	CV (%)	C _{vh} (%)
500	0.5166	0.0017	0.32	6.22
1500	1.584	0.018	1.15	5.32

Table S2. Results of reproducibility of the modular micro-FIA system.

Copper concentration (mg L ⁻¹)	Mean (mg L ⁻¹)	Standard deviation (mg L ⁻¹)	CV (%)	C _{vh} (%)
50	0.046	0.003	7.39	8.88
500	0.391	0.020	5.09	6.28
1000	0.82	0.04	4.23	5.66
1500	1.23	0.05	3.73	5.32
2000	1.56	0.06	3.86	5.10

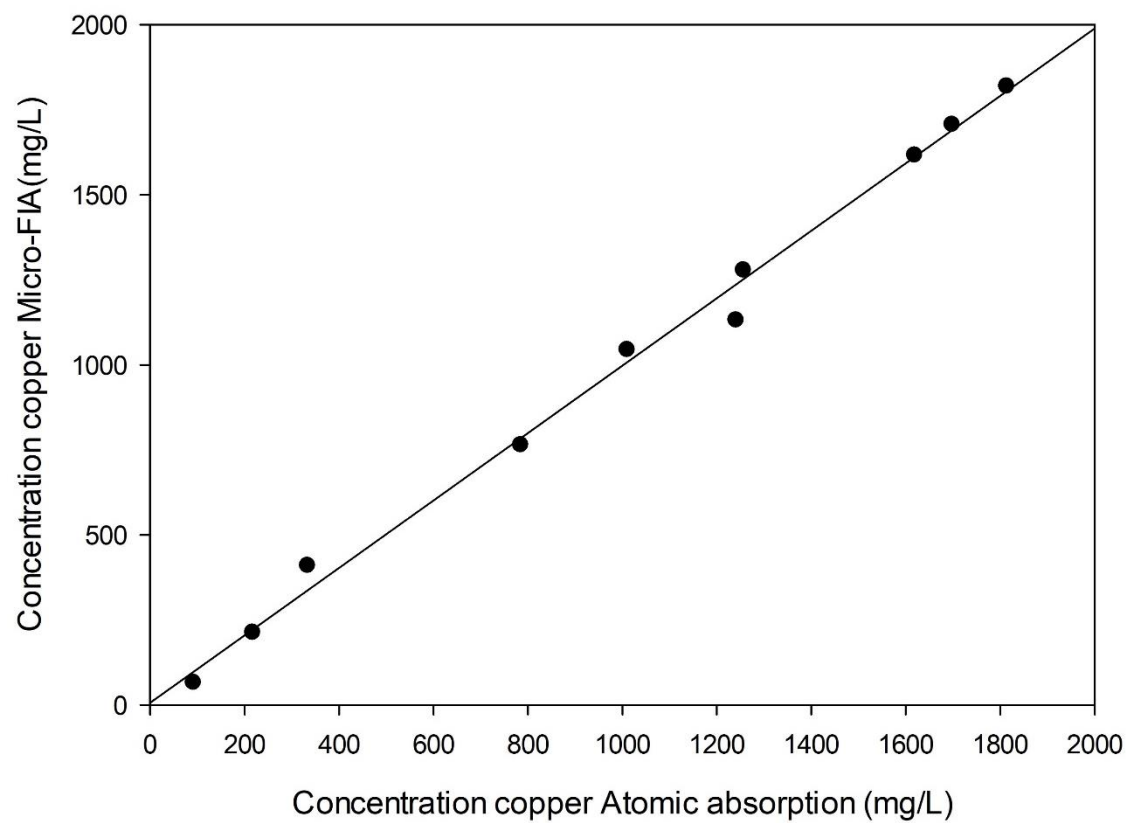


Figure S3. Linear regression test to compare the reference method (atomic absorption) and the proposed micro-FIA analyzer.

Table S3. An overview on better reported optical methods for the determination of Cu(II).

Method	Linear range	Material of channels	Reactant	Precision (RSD%)	Accuracy (R%)	Selectivity	Measure frequency (h ⁻¹)	LoD	LoQ	Reference
UV-vis FIA	0.4-40 mg L ⁻¹	Teflon	Neocuproine	2.31	97-104.9	High, not interferences	69	0.1 mg L ⁻¹	0.3 mg L ⁻¹	[53]
UV-vis FIA UV-vis SIA	1-170 mg L ⁻¹ 0.01-110 mg L ⁻¹	Teflon	Glycine	0.090 0.85	102 100	Do not found interferences	120 100	0.1 mg L ⁻¹ 0.010 mg L ⁻¹	1 mg L ⁻¹ 0.01 mg L ⁻¹	[54]
UV-vis FIA	0.05-8 µg L ⁻¹	Teflon	Catalytic effect of Cu(II) on redox with cysteine with Fe(III), and Fe(II) formed reacts with 2,4,6-tris(2-pyridyl)-1,3,5-triazine	0.8-1.6	101	500 mg·L ⁻¹ Fe(III), Hg(II), Cd(II), V(V)	30	0.005 µg L ⁻¹	0.05 µg L ⁻¹	[55]
UV-vis FIA	1-12 mg L ⁻¹	PTFE tubing	4-(2- pyridylazo)resorcinol	0.2-0.9	-	-	-	0.6 mg L ⁻¹	0.1 mg L ⁻¹	[56]
Amperometric detection FIA	1.6-6.4 mg L ⁻¹ 0.05-0.35 mg L ⁻¹	-	S. cerevisiae 19.3/YEp352-CUP1-lacZ and S. cerevisiae SEY6210/YEp352-CUP1-lacZ	10-15	-	High	0.7	2.1 mg L ⁻¹ 0.0067 mg L ⁻¹	3.2 mg L ⁻¹ 0.097 mg L ⁻¹	[57]
UV-vis FIA	5-120 µg L ⁻¹	Stainless-steel	acetylsalicylhydroxamic acid	0.64	99	Fe(III) and Cr(III) has a negligible effect	80	1 µg L ⁻¹	5 µg L ⁻¹	[58]
Catalytic Photometric FIA	0.05-5 µg L ⁻¹	Teflon	Oxidation coupling of p-anisidine with N,N-dimethylaniline in the presence of hydrogen peroxide to form a dye	0.46-0.96	99	Only diphosphate has important effect	30	0.01 µg L ⁻¹	0.05 µg L ⁻¹	[59]
UV-vis FIA	-	Teflon	1,5-diphenylcarba	< 2	-	-	120	1.41 µg L ⁻¹	-	[60]

UV-vis FIA	34-2000 mg L ⁻¹	PLA and PVC	Neocuproine	0.3-1.1	101±2	High, not interferences	7	9 mg L ⁻¹	34 mg L ⁻¹	This work
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